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ROD (Record of Decision) Annual Report, FY 1988

(U.S.) Environmental Protection Agency, Washington, DC

Jul 89

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Abstract: In FY 1988, EPA continued to implement the Superfund Amendments and Reauthorization Act of 1986 (SARA). In the remedial decision making process, Section 121 of SARA mandates the selection of a remedial action that is protective of human health and the environment. One hundred fifty-two RODs were signed during FY 1988. This represents a 100 percent increase over FY 1987. Ninety-five of the FY 1988 RODs addressed final source control. The remaining 57 RODs selected ground water remedies only (39), interim source control actions (4), or no further action (14). Forty-nine RODs selected both source control and ground water remedies. Consistent with the policy started in FY 1986 to delegate ROD approval authority to the Regions, 99 percent of all FY 1988 RODs were approved at the Regional level.

United States
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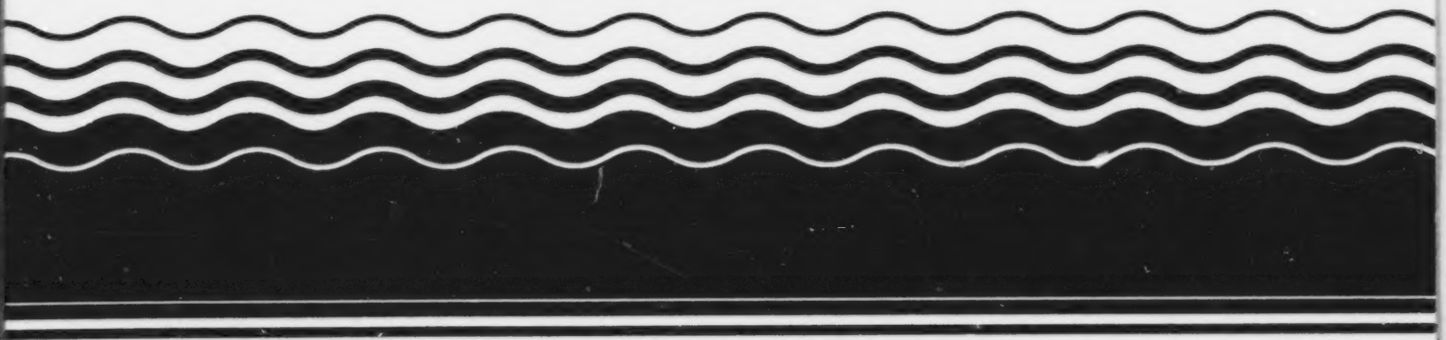
Superfund

ROD ANNUAL REPORT FY 1988



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ROD Annual Report
FY 1988

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FY 1988 ROD ANNUAL REPORT
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SECTION I

INTRODUCTION

INTRODUCTION

In FY 1988, EPA continued to implement the Superfund Amendments and Reauthorization Act of 1986 (SARA). In the remedial decision making process, Section 121 of SARA mandates the selection of a remedial action that is protective of human health and the environment, attains applicable or relevant and appropriate Federal and State requirements (ARARs), is cost-effective, and utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, SARA includes a preference for treatment which permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes and requires an explanation in those cases in which the selected remedy does not satisfy this preference. The RODs listed in this report document the application of these mandates in the remedial program in FY 1988.

Record of Decision (ROD)

One hundred fifty-two RODs were signed during FY 1988. This represents a 100 percent increase over FY 1987. Ninety-five of the FY 1988 RODs addressed final source control. The remaining 57 RODs selected ground water remedies only (39), interim source control actions (4), or no further action (14). Forty-nine RODs selected both source control and ground water remedies. Consistent with the policy started in FY 1986 to delegate ROD approval authority to the Regions, 99 percent of all FY 1988 RODs were approved at the Regional level.

In keeping with SARA Section 121 and program expectations, treatment of the source was selected in 68 of the 95 final source control sites. In addition, 20 of the 27 source control sites which selected containment only were large landfills, mining waste/smelter sites or asbestos sites. Exhibit 1 provides a quantitative summary of FY 1988 remedy selections by site lead. Exhibit 2 provides a summary of remedial action costs as presented in FY 1988 RODs.

Exhibit 3 graphically depicts the frequency with which treatment technologies were selected in FY 1988. Incineration/thermal destruction was selected most frequently (26 sites), followed by solidification/stabilization (18 sites), and vacuum extraction (10 sites). Exhibit 4 groups FY 1988 RODs by the types of technologies selected. In addition, Exhibit 5 lists those RODs between FY 1982 and FY 1987 that selected treatment technologies.

As a reference document, the FY 1988 ROD Annual Report is designed to provide the Regions, Headquarters, and the public with summary information on FY 1988 RODs. It consists of the following sections:

- Introduction - highlights specific accomplishments in the ROD process
- ROD Abstracts - describes site conditions, key contaminants, selected remedial actions, specific performance standards and goals, institutional controls, present worth or capital costs and operation and maintenance costs, and site-specific key words for each FY 1988 ROD
- FY 1988 ROD Summary Table - provides the remedial action number (e.g., 1st, 2nd, etc.), and summarizes the media and associated contaminants, waste volume, components of the selected remedy, specific cleanup goals, and present worth or capital costs and operation and maintenance costs for each FY 1988 ROD
- FY 1982-1987 ROD Summary Table - provides the remedial action number, and summarizes the media and associated contaminants, waste volume, components of the selected remedy, specific cleanup goals, and present worth or capital costs and operation and maintenance costs for each FY 1982-1987 ROD
- ROD Key Word List - provides major key word categories and their subcategories for all RODs approved to date. A key word list index located at the beginning of the section provides an overview of all categories and subcategories within the list.

Exhibit 1

FY 1988 ROD TECHNOLOGY SUMMARY

SOURCE CONTROL REMEDIATION*	TOTAL NUMBER OF OCCURRENCES
Treatment Technology	76
Incineration/Thermal Destruction	26
Solidification/Stabilization	18
Vacuum Extraction**	10
Volatilization/Soil Aeration	6
Soil Washing/Flushing	6
Biodegradation/Land Application	6
Other Treatment Technologies	4
Containment Only	27
Onsite	24
Offsite	3
Other Source Control Remedies	3
Temporary Storage	1
NON-SOURCE CONTROL REMEDIATION TECHNOLOGY SELECTIONS*	
Pump and Treatment	78
Alternate Water Supply	13
Other	5
Leachate Treatment	3

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* More than one remedy may be associated with a site.

** Includes amended ROD which replaces Tyson's Dump, PA 12/21/84 ROD.

Exhibit 2

FY 1988 ROD REMEDY COST *

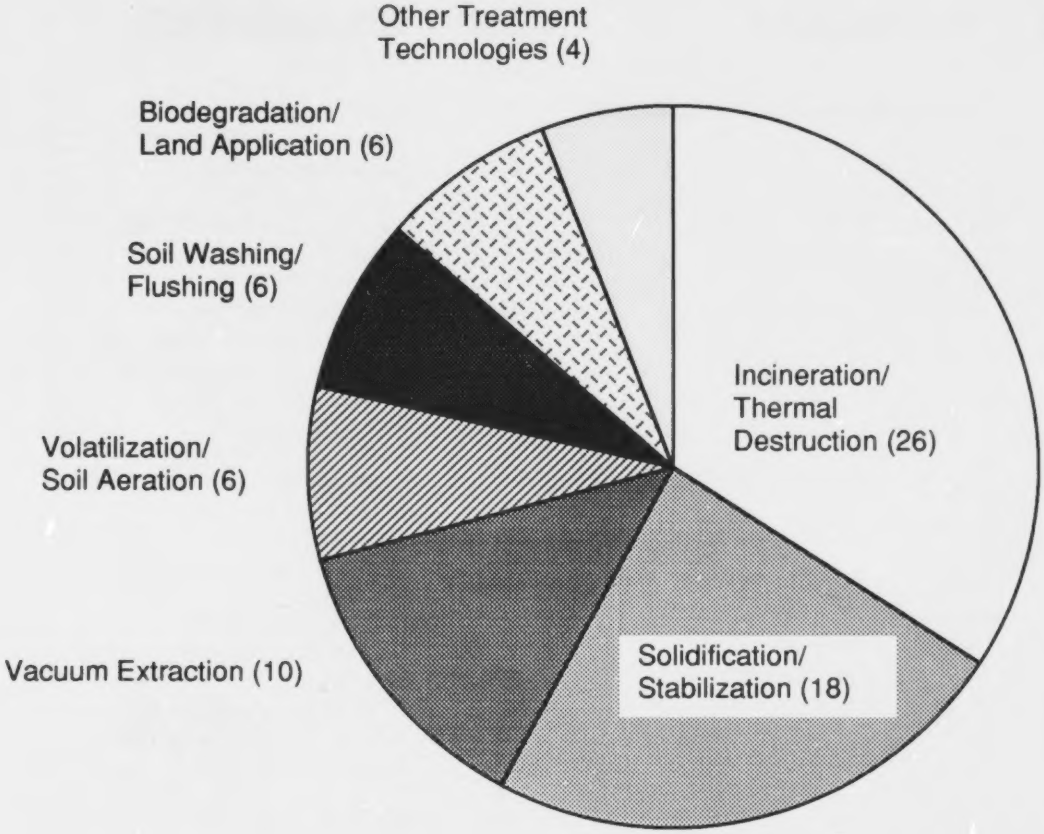
	0 - $2M	2.1 - $5M	5.1 - $10M	10.1 - $20M **	20.1 - $30M	$30.1M+
TOTAL	43	44	31	15	14	6

* Estimates are based on present worth costs when available.

** Includes amended ROD which replaces Tyson's Dump, PA 12/21/84 ROD.

Exhibit 3

SUMMARY OF FY 1988 ROD SITES SELECTING TREATMENT TECHNOLOGIES AS COMPONENTS OF SOURCE CONTROL REMEDIES



NUMBER OF SITES	PERCENT	TYPES
26	34%	Incineration/Thermal Destruction
18	24%	Solidification/Stabilization
10	13%	Vacuum Extraction**
6	8%	Volatilization/Soil Aeration
6	8%	Soil Washing/Flushing
6	8%	Biodegradation/Land Application
4	5%	Other Treatment Technologies
76*	100%	

* More than one treatment technology may be associated with a site.

** Includes amended ROD which replaces Tyson's Dump, PA 12/21/84 ROD.

Exhibit 4

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED AT FY 1988 ROD SITES

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY88	Incineration/Thermal Destruction (26)	I	* Rose Disposal Pit, MA
		II	Brewster Well Field, NY
		II	Ewan Property, NJ
		II	Lipari Landfill, NJ
		II	Love Canal (10/26/87), NY
		II	Reich Farms, NJ[b]
		II	York Oil, NY[c]
		III	Berk Sand Pits, PA
		III	Delaware Sand & Gravel, DE
		III	Douglassville Disposal, PA
		III	Drake Chemical, PA
		III	Fike Chemical, WV[b]
		III	* Ordnance Works Disposal, WV
		III	Southern Maryland Wood, MD
		III	Wildcat Landfill, DE
		IV	Zellwood, FL[c]
		V	Forest Waste Disposal, MI
		V	Fort Wayne, IN
		V	LaSalle Electrical, IL
		V	Summit National, OH
		VI	* Brio Refining, TX
		VI	Old Midland Products, AR
		VII	Minker Stout/Romaine, MO
		VII	* Syntex Verona, MO
		VII	Times Beach, MO
		VIII	* Broderick Wood, CO
	Solidification/Stabilization (18)	II	Love Canal (09/26/88), NY
		II	Marathon Battery, NY[c]
		II	York Oil, NY[c]
		III	Aladdin, PA
		III	Fike Chemical, WV[b]
		IV	* Chemtronics, NC
		IV	* Flowood, MS
		V	Mid-State Disposal, WI
		V	Velsicol Chemical, IL
		VI	* Bailey Waste Disposal, TX
		VI	* Industrial Waste Control, AR
		VII	Arkansas City Dump, KS
		VII	Midwest Manufacturing, IA
		IX	* Selma Pressure Treating, CA
		X	* Commencement Bay/Nearshore, WA
		X	Frontier Hard Chrome (12/30/87), WA
		X	* Gould, OR
		X	* Pacific Hide & Fur, WA

---

* Enforcement-lead sites.

[a] Site may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

Exhibit 4

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED AT FY 1988 ROD SITES (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES [a]	REGION	SITE NAME, STATE
FY88	Vacuum Extraction (10)	I	Groveland Well, MA
		I	Keefe Environmental, NH
		III	*Bendix Flight Systems, PA[c]
		III	*Tyson's Dump, PA[d]
		IV	*Airco, KY
		IV	*Goodrich, B.F., KY
		VI	*South Valley (PL-83), NM
		VII	Hastings (09/28/88), NE
		VII	Hastings (09/30/88), NE
		IX	*Motorola, AZ
	Volatilization/Soil Aeration (6)	I	Cannon Engineering, MA
		II	Marathon Battery, NY[c]
		II	Reich Farms, NJ[b]
		III	*Bendix Flight Systems, PA[c]
		IV	*Wamchem, SC
		VI	Long Prairie, MN
	Soil Washing/Flushing (6)	II	L.A. Clarke & Son, VA[c]
		IV	Zellwood, FL[c]
		V	United Scrap Lead, OH
		V	*U.S. Aviex, MI
		VI	*Koppers/Texarkana , TX
		VI	*South Cavalcade, TX
	Biodegradation/Land Application (6)	I	Iron Horse Park, MA
		III	L.A. Clarke & Son, VA[c]
		IV	*Brown Wood Preserving, FL
		VI	*Atchison/Santa Fe (Clovis), NM
		VI	French Limited, TX
		VI	North Cavalcade, TX
	Other Treatment Technologies (4)	II	*GE Wiring, PR
		V	Pristine, OH
		VI	Sol Lynn (03/25/88), TX
		VII	*Fulbright, MO

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* Enforcement-lead sites.

[a] Site may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

[d] Amended ROD for Tyson's Dump, PA 12/21/84 ROD.

Exhibit 5

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED AT FY 1982-1987 ROD SITES

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY82	Solidification/Stabilization (1)	III	Bruin Lagoon, PA
FY83	------		------
FY84	Incineration/Thermal Destruction (3)	V	Berlin & Farro, MI
		V	Laskin/Poplar, OH
		X	*Western Processing, WA
	Solidification/Stabilization (1)	VI	Bioecology, TX
	Biodegradation/Land Application (1)	VI	Old Inger, LA
FY85	Incineration/Thermal Destruction (7)	II	Bog Creek Farm, NJ
		II	Bridgeport, NJ
		II	Swope Oil, NJ
		V	Acme Solvents, IL
		VI	MOTCO, TX
		VI	Triangle Chemical, TX
		VIII	Woodbury Chemical, CO
	Solidification/Stabilization (2)	II	Wide Beach, NY
		IV	Davie Landfill, FL
	Vacuum Extraction (1)	V	Verona Well Field, MI
	Volatilization/Soil Aeration (2)	I	McKin, ME
		VI	Triangle Chemical, TX
	Soil Washing/Flushing (2)	II	Goose Farm, NJ
		X	South Tacoma/Well 12-A, WA
	Biodegradation/Land Application (1)	V	Byron/Johnson Salvage, IL

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* Enforcement-lead sites.

[a] Site may contain non-source control remediation measures.

Exhibit 5

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED AT FY 1982-1987 ROD SITES (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY86	Incineration/Thermal Destruction (12)	I	Baird & McGuire, MA
		II	*Hyde Park, NY
		III	Drake, PA
		III	Westline, PA
		IV	Coleman Evans, FL
		IV	Mowbray Engineering, AL[b]
		V	Arrowhead Refinery, MN
		V	Fields Brook, OH[c]
		V	LaSalle Electrical, IL
		V	Metamora Landfill, MI
		V	Spiegelberg Landfill, MI
		VI	Sikes Disposal Pit, TX
	Solidification/Stabilization (9)	II	Marathon Battery, NY
		III	Bruin Lagoon, PA
		IV	Mowbray Engineering, AL[b]
		IV	*Pepper's Steel, FL
		IV	Sapp Battery, FL
		V	Burrows Sanitation, MI
		V	Fields Brook, OH[c]
		V	Forest Waste, MI
		X	*Queen City Farms, WA
	Volatilization/Soil Aeration (4)	I	Tinkham Garage, NH[b]
		II	Caldwell Trucking, NJ
		II	Metaltec/Aerosystems, NJ
		IV	Hollingsworth Solderless, FL
	Soil Washing/Flushing (2)	I	Tinkham Garage, NH[b]
		X	United Chrome, OR
	Biodegradation/Land Application (3)	I	Tinkham Garage, NH[b]
		III	Leetown Pesticide, WV
		V	*Burlington Northern, MN

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* Enforcement-lead sites.

[a] Site may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

Exhibit 5

SOURCE CONTROL TREATMENT TECHNOLOGIES SELECTED AT FY 1982-1987 ROD SITES (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY87	Incineration/Thermal Destruction (13)	I	Davis Liquid Waste, RI[c]
		I	*Ottati & Goss, NH[c]
		II	Williams Property, NJ
		IV	*Geiger (C&M Oil), SC[c]
		IV	*Sodyeco, NC
		IV	Tower Chemical, FL
		V	Laskin/Poplar, OH
		V	Rose Township, MI
		VI	Bayou Bonfouca, LA
		VI	Cleve Reber, LA
		VI	*Gurley Pit, AR[c]
		VI	*Hardage/Criner, OK
		VI	Sand Springs Petrochemical Complex, OK[c]
	Solidification/Stabilization (9)	II	Chemical Control, NJ
		IV	*Geiger (C&M Oil), SC[c]
		IV	*Gold Coast, FL
		IV	Independent Nail, SC
		V	Liquid Disposal Landfill, MI
		V	*Northern Engraving, WI
		VI	*Gurley Pit, AR[c]
		VI	*Mid-South, AR
		VI	Sand Springs Petrochemical Complex, OK[c]
	Vacuum Extraction (1)	V	*Seymour, IN
	Volatilization/Soil Aeration (2)	I	*Ottati & Goss, NH[c]
		II	*Waldick Aerospace, NJ
	Soil Washing/Flushing (2)	I	Davis Liquid Waste, RI[c]
		IV	Palmetto Wood, SC
	Biodegradation/Land Application (1)	II	*Renora, Inc., NJ
	Other Treatment Technologies (4)	I	Resolve, MA
		III	*Palmerton Zinc, PA
		III	*West Virginia Ordnance Works, WV
		VIII	Central City/Clear Creek, CO

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* Enforcement-lead sites.

[a] Site may contain non-source control remediation measures.

[b] ROD allows for implementation of one of two source control treatment technologies.

[c] ROD selected two source control treatment technologies.

SECTION II

RECORDS OF DECISION ABSTRACTS

Each ROD summary presented in this section consists of the following:

- ROD Abstract - summarizing site location and background information, contaminated media, key contaminants, selected remedial action, and present worth or capital costs and O&M costs.
- Performance Standards or Goals - describing qualitative/quantitative cleanup criteria.
- Institutional Controls - describing site ordered restrictions.
- Key Words - highlighting treatment technologies, contaminated media, key contaminants, and major key word categories for the RODs. A list of RODs by key words is presented in the last section of this document.

CANNON ENGINEERING, MA
First Remedial Action - Final
March 31, 1988

ROD ABSTRACT

The Cannon Engineering Corporation (CEC) facility is located in a small industrial park in the western part of the Town of Bridgewater, Plymouth County, Massachusetts. The four-acre site is bordered by industrial developments to the north and east and a wooded lowland to the south and west. A wetland area lies south and west of the site. CEC, which has owned the property since 1974, handled, stored, and incinerated chemical waste onsite from 1974 to 1980. EPA conducted site investigations between 1980 and 1982, and in October 1982, Massachusetts contracted for the removal of sludge and liquid waste from onsite tanks and drums. In January 1988, EPA provided for the removal and disposal of numerous hazardous materials abandoned at the site. This remedial action addresses three discrete areas of soil and sediment contamination located in the northwestern and southern portions of the site, and the buildings, tanks, and other contaminated structures onsite. The volume of contaminated soil is estimated to be 325 yd^3. The primary contaminants of concern affecting the ground water, soil, and debris are VOCs including benzene, TCE, and vinyl chloride, and other organics including PCBs and PAHs.

The selected remedial action for this site includes: access restrictions; excavation and onsite treatment of VOC-contaminated soil by thermal aeration, and excavation and offsite treatment of PCB-contaminated soil by incineration; decontamination, removal, and disposal of contaminated buildings, tanks, and structures; additional soil sampling to assess effectiveness; ground water monitoring and implementation of a water quality monitoring program to assess natural attenuation of contaminants; and institutional controls to restrict onsite ground water use. The estimated present worth cost for this remedial action is between $3,400,000, and $4,505,000 with present worth O&M of $700,000.

PERFORMANCE STANDARDS OR GOALS: Target cleanup goals for soil include benzene 55 ug/kg, and TCE 71 ug/kg (based on leaching potential into ground water as determined using the Organic Leaching Model), and PCBs 9 mg/kg (based on risk levels). Target goals for ground water include benzene 5 ug/l (MCL), TCE 5 ug/l (MCL), and vinyl chloride 2 ug/l.

INSTITUTIONAL CONTROLS: Deed and land restrictions will be implemented to prevent the use of onsite ground water.

KEYWORDS: Aeration; ARARs; Benzene; Clean Air Act; Clean Water Act; Debris; Decontamination; Deed Restriction; Direct Contact; Excavation; Flood Plain; Ground Water; Ground Water Monitoring; Incineration; Institutional Controls; MCLs; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PAHs; PCBs; Soil; RCRA; Safe Drinking Water Act; State Criteria; TCE; Toxic Substances Control Act; Treatment Technology; VOCs; Wetlands.

CHARLES GEORGE LANDFILL, MA
Third and Fourth Remedial Actions - Final
September 29, 1988

ROD ABSTRACT

The Charles George Landfill (CGL) site is located approximately one mile southwest of the Town of Tyngsborough, Massachusetts. The 70-acre site is bounded by Flint Pond Marsh (wetland area) and Flint Pond to the east, Dunstable Brook to the west, and the Cannongate Condominium complex to the southeast. Land use in the vicinity of the site is predominantly rural and residential but also includes some light industry and seasonal livestock grazing. The landfill contains municipal waste disposed of onsite from the mid-1950s until the landfill closed in 1983 by order of the Massachusetts Attorney General. Hazardous industrial waste was also disposed of primarily in the western area of the site from 1973 until at least 1976. The site came to the attention of the Massachusetts Department of Environmental Quality Engineering (DEQE) when the deep bedrock wells in use by the Cannongate Condominium complex became contaminated with VOCs. The DEQE ordered the wells closed in 1982. EPA conducted ground water monitoring in 1981 and 1982, and also undertook emergency removal actions beginning in August 1983 and continuing through March 1984. Presently the site has a thin soil cover, 2 surface water and leachate lagoons, 2 leachate collection systems, 1 recirculating pump station, and 12 shallow gas vents. Construction of a full synthetic landfill cap was addressed in a previous ROD and should begin in early 1989. This ROD encompasses the third and fourth operable units and focuses on the control and cleanup of contaminants that have spread or are spreading from the site, including the treatment of leachate collected as part of the cap system. Investigations have identified contaminated ground water in overburden, shallow bedrock, and deep bedrock zones. In addition, an estimated 500 yd^3 of sediments require remediation, and vent emissions from the landfill are contaminated with a wide array of VOCs. The primary contaminants of concern affecting the ground water, sediments and air, are VOCs including benzene and TCE, organics including PAHs, and metals including arsenic.

The selected remedial action for this site includes: extraction and treatment of shallow ground water plumes and leachate collected from the landfill cap system using biological treatment, metals precipitation and carbon adsorption with onsite discharge of the treated water into the aquifer or offsite discharge into nearby surface water; collection and incineration of landfill vent gas emissions; excavation and solidification of approximately 500 yd^3 of contaminated Dunstable Brook sediments and placement beneath the Phase II landfill cap; ground water monitoring and access restrictions. The estimated present worth cost for this remedial action is $11,320,000 which includes O&M costs of $601,000.

CHARLES GEORGE LANDFILL, MA
Third and Fourth Remedial Actions - Final
September 29, 1988
(Continued)

PERFORMANCE STANDARDS OR GOALS: The target cleanup levels for ground water are benzene and TCE 0.005 mg/l, cadmium 0.010 mg/l, and arsenic and silver 0.05 mg/l, all based on MCLs. Contaminants in the deep aquifer cannot practicably be extracted but will attenuate to health-based levels within a depth of 500 feet. The cleanup goal for sediments requires PAH levels of less than 1.0 mg/kg, based on a risk level of 4×10^{-6}. Target levels for 12 VOCs in vent emissions are listed based on a 1×10^{-6} cumulative risk level.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Air Monitoring; ARARs; Arsenic; Benzene; Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Standards; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Leachate Collection/Treatment; MCLs; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Safe Drinking Water Act; Sediments; Solidification; TCE; Treatment Technology; VOCs; Wetlands.

GROVELAND WELLS, MA
First Remedial Action
September 30, 1988

ROD ABSTRACT

The 850-acre Groveland Wells site is located in the Town of Groveland, Essex County, Massachusetts, within the lower Johnson Creek drainage basin. The site includes the watershed and aquifer which recharge two municipal supply wells, Station Nos. 1 and 2, and three known sources of soil, surface water, and ground water contamination: the Valley site, the A.W. Chesterson site, and the Havenhill Municipal Landfill site. This remedial action addresses source control at the Valley site. The remaining operable units of the Groveland Wells site will be addressed in subsequent remedial actions. The Valley site operable unit is located in the far northwestern section of the Town of Groveland, and is bordered to the north and south by residences within 100 feet of the site. The Town of Groveland's municipal water supply well, Station No. 1, is located approximately 3,500 feet northeast and downgradient of the Valley site, and is currently being treated to remove VOCs as part of an initial remedial measure by EPA. The Valley Manufactured Products Company (Valley) began operating a metals and plastic parts manufacturing business in 1963 on a 1.5-acre parcel of property owned by Groveland Resources Corporation (GRC). The Valley site area consists of the land within and immediately adjacent to the GRC property boundaries and contains three subsurface disposal systems, and an oil storage and recovery system consisting of six underground tanks and a 55-gallon drum storage area both of which were used to store cutting oils and solvents such as TCE and methylene chloride. These subsurface disposal systems dispersed liquid effluent into the ground by filtration through a sand and gravel leach field. According to Valley/GRC, more than 20 gallons of waste cutting oil containing TCE and other hazardous substances were released each month on the ground at the south end of the building between 1964 and 1972. Also, at least four 55-gallon drums of the same material was used as a defoliant on the eastern side of the building. Between 1979 and 1984, effluent from an acid bath finishing process was discharged to an underground leach field, and TCE-contaminated oil was released on the soil under a loading dock and into a floor drain. In 1973, 500 gallons of raw TCE was released from an underground storage tank into the soil, and additional waste oils and solvents were dumped on the ground. A site investigation in 1983 revealed high levels of TCE, arsenic, lead, and copper in the underground disposal systems. Additional sample analysis has detected soil contaminated with VOCs from the surface to a depth of 15 feet in various locations onsite. Analysis of surface water and sediments from Mill Pond, downstream of the Valley site, as well as ground water from monitoring wells in the site area, also detected VOC contamination. Based on the concentration of VOCs detected in the subsurface soil and ground water, and historical site use information, both media are believed to be contributing to ground water and surface water contamination in the

GROVELAND WELLS, MA
First Remedial Action
September 30, 1988
(Continued)

Valley site area and the Mill Pond/Johnson Creek watershed and aquifer. The primary contaminants of concern affecting soil, sediments, ground water, and surface water are VOCs including TCE, PCE, and toluene, and metals including arsenic and lead.

The selected remedial action for the Valley site operable unit includes: in situ vacuum extraction of approximately 20,000 yd^3 of unsaturated soil followed by activated carbon treatment of the extracted VOCs; onsite ground water pump and treatment by carbon adsorption and aeration, with recharge to the aquifer of a portion of the treated ground water upgradient of the site to accelerate removal of saturated zone soil contamination, and discharge of the remainder of the treated ground water to the aquifer downgradient of the site, and treatment of air emissions from the aeration process by carbon adsorption; ground water monitoring; and sealing or disconnecting all drains and lines to the acid bath finishing process disposal system. Incidental treatment of inorganic compounds and other contaminants will be provided as necessary in order to efficiently operate the VOC contaminant treatment system and to meet applicable discharge permit requirements. The estimated present worth cost of this remedial action is $4,165,000, with a 10-year present worth O&M cost of $2,677,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels for VOCs are based on MCLs or an excess cancer risk level of 10^{-6}. Individual goals include PCE 5.0 ug/l (MCL), TCE 5.0 ug/l (MCL) and toluene 2,000 ug/l. Inorganic contaminant cleanup levels are based on State of Massachusetts Ground Water Quality Standards and ground water discharge permit requirements. Individual goals include arsenic 50 ug/l and lead 50 ug/l. Individual soil cleanup goals for VOCs are based on achieving the target ground water levels and include TCE 6.3 ug/kg and PCE 18.2 ug/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Acids; Aeration; Air Monitoring; ARARs; Arsenic; Clean Air Act; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Lead; Metals; O&M; Offsite Discharge; Oils; Onsite Discharge; Onsite Treatment; Organics; Plume Management; Public Exposure; RCRA; Safe Drinking Water Act; Soil; State Criteria; TCE; Treatment Technology; Vacuum Extraction; VOCs.

IRON HORSE PARK, MA
First Remedial Action
September 15, 1988

ROD ABSTRACT

The Iron Horse Park site is a 552-acre industrial complex and railyard located in North Billerica, Massachusetts. The site includes manufacturing and railyard maintenance facilities, open storage areas, landfills, and wastewater lagoons. A long history of activities at the site has resulted in contamination of soil, ground water, and surface water. In August 1984, EPA, under its removal authority, covered an onsite asbestos landfill located northwest and adjacent to the lagoons area. In September 1984, the site was placed on the NPL. In 1985, EPA began evaluations of the site and concluded that the size and complexity of the site, as well as the discreet nature of the contamination, necessitated dividing the site into several separate problem areas. This ROD addresses the cleanup of the Boston and Maine Wastewater Lagoons (B&M Lagoons) and surrounding area, which are operated by Boston & Maine (B&M) Corporation. The B&M Lagoons are a series of lagoons located within a 150-acre parcel of land leased from the Massachusetts Bay Transportation Authority, which uses most of the land to operate a passenger rail service. The lagoons have been receiving untreated industrial and sanitary wastewater from the manufacturing and railyard maintenance facilities since 1915. The lagoon area consists of the North and South lagoons, currently receiving wastewater, an overflow lagoon, one inactive lagoon used until 1954, and an empty lagoon that was never used. The lagoons contain approximately 7,800 yd^3 of soil and sludge contaminated primarily with VOCs, low levels of PAHs, and metals. In addition, approximately 20,000 yd^3 of soil and sludge dredged from the lagoon bottoms and disposed in piles along the lagoon banks are contaminated with low levels of organics and metals. The piles of dredged material and the sludge in the lagoons are considerd to not contribute significantly to ground water contamination. This conclusion is based on the results of the TCLP test which indicates that these materials do not leach contaminants in significant concentrations. Additionally, the contaminants found in these materials are generally not found in the ground water. B&M has been ordered to stop discharging wastewater to the B&M Lagoons by the end of 1988, and plans to tie-in to the town of Billerica's sewer system. Subsequent RODs will address other portions of the site including a landfill and site-wide ground water. The primary contaminants of concern affecting the soil, sludge, and debris are VOCs, organics including PAHs, and metals including arsenic and lead.

The selected remedial action for this site includes: excavation and onsite biodegradation of contaminated soil and sludge with residual disposal to the lagoon area followed by covering with a clean soil cover and revegetation; and decontamination of the lagoon system piping and pumps. The estimated capital cost for this remedial action is $2,273,000 with present worth O&M of $47,000.

IRON HORSE PARK, MA
First Remedial Action
Continued

PERFORMANCE STANDARDS OR GOALS: Treatment of soil and sludge will attain a less than 10^{-6} excess cancer risk for industrial use of the area, and a less than 10^{-5} excess cancer risk for residential use of the area. Treatment should reduce contaminant concentration in wastes by 70-80 percent, and will meet the state pathogen reduction requirements for sludge. Individual cleanup levels were not specified.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to restrict land use.

KEYWORDS: ARARs; Arsenic; Biodegredation; Carcinogenic Compounds; Containment; Debris; Decontamination; Deed Restrictions; Direct Contact; Excavation; Filling; Inorganics; Institutional Controls; Land Treatment; Leachability Tests; Lead; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; Sludge; Soil; State Criteria; State Permit; Treatment Technology; VOCs.

KEEFE ENVIRONMENTAL SERVICES, NH
Second Remedial Action - Final
March 21, 1988

ROD ABSTRACT

The Keefe Environmental Services (KES) site is located in a semi-rural area in Epping, New Hampshire. Surface water from sections of this site flows toward a wetland area to the immediate south. Considerable filling and excavation have occurred at the site using the materials for site fill, road construction, surface leveling, and dike construction purposes. In May 1978, Mr. Paul Keefe constructed a chemical waste storage facility by establishing drum storage areas, large storage tanks, equipment shelters and a bulking area. A 700,000 gallon capacity, synthetically lined, waste lagoon was also installed. During April 1979, the New Hampshire Bureau of Solid Waste Management (NHBSWM) and the Division of Public Health Services (DPHS) ordered KES to clean up a number of leaking storage tanks, ruptured drums, improperly dumped latex waste, and contaminated soils. At this time, a series of complaints were made by local residents, concerning strong odors attributed to the site. These complaints resulted in legal action against KES. During September 1979, a surface water and ground water sampling program identified seven chlorinated hydrocarbons in the ground water wells. This resulted in the issuance of a second cleanup order focusing on the removal of all leaking drums, spills, and contaminated soil, daily inspection of drums for leaks, and reduction in total number of drums stored onsite. Beginning in November 1979, drinking water wells of the twelve surrounding residences were sampled by the New Hampshire Water Supply and Pollution Control Commission (NHWSPCC) for chemical compounds and biological parameters. The sampling indicated the presence of several VOCs in some wells. Removal actions initiated between June 1981 and November 1982, and then again in March 1983, removed 2,029 fifty-five gallon drums, 84 thirty gallon drums, 47 cauldrons and trays, 51 carboys, 1,630 five gallon pails, 124 empty drums, and 10 fiber and 155 miscellaneous containers. In addition, approximately 4,100 five gallon drums, 4 five-thousand gallon, and 4 ten-thousand gallon above-ground tanks were removed from the site. A first operable unit ROD, signed in November 1983, approved the removal of contents from the lagoon, lagoon liner, and adjacent contaminated soil. This second operable unit addresses soil and ground water contaminated with VOCs.

The selected remedial action for this site includes: in-situ treatment of soil using vacuum extraction with discharge to the atmosphere; and ground water pump and treatment using air stripping, filtration, and carbon adsorption with discharge to a ground water recharge area adjacent to the wetland along the site border. The estimated capital cost for this remedial action is $1,942,300 with present worth O&M of $4,157,700.

KEEFE ENVIRONMENTAL SERVICES, NH
Second Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup will meet a 10^{-5} cumulative excess risk. Individual ground water cleanup goals include: benzene 5 ug/l (MCL), trichloroethylene 5 ug/l (MCL), tetrachloroethylene 5 ug/l (based on TCE level), 1,2-dichloroethane 5 ug/l (MCL), and 1,1-dichloroethylene 7 ug/l (MCL). Cumulative soil cleanup goals will attain a 5.7×10^{-5} excess cancer risk level. Individual soil levels include: benzene 20.8 ug/kg, PCE 91.0 ug/kg, TCE 31.5 ug/kg, 1,2-dichloroethane 3.5 ug/kg, and 1,1-dichloroethylene 22.8 ug/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Benzene; Carcinogenic Compounds; Clean Water Act; Direct Contact; Flood Plain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Land Treatment; O&M; Onsite Discharge; Onsite Treatment; RCRA; Safe Drinking Water Act; Soil; State Criteria; Surface Water; Treatment Technology; Vacuum Extraction; VOCs; Wetlands.

LANDFILL & RESOURCE RECOVERY, RI
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The Landfill & Resource Recovery (L&RR) site is located in North Smithfield, Rhode Island, and consists of a 28-acre landfill and a sand and gravel pit. Several unnamed streams lie to the south and east of the site and flow through wetlands located adjacent to the site area. Several homes near the site use ground water for drinking, and the Statesville reservoir, used for recreational activities, is located approximately 0.5 mile from the site. The L&RR site is a former sand and gravel pit that began accepting domestic, commercial, and industrial wastes in 1927. Site owners claim the hazardous materials were mixed in with municipal refuse and deposited in the north-central area of the site, but other reports indicate hazardous waste was spread over the entire site area. When hazardous waste disposal ceased in 1979 the owners placed a PVC cover over the north-central area to prevent stormwater infiltration. Commercial and domestic wastes were disposed of on top of and around the area in subsequent years. In 1983, the Rhode Island Department of Health installed monitoring wells onsite to ensure compliance with State regulations, and based on sampling results, ordered the site closed. Upon final closure in 1985 the owners covered 80 percent of the landfill area with one foot of sand, another synthetic cover and topsoil. Eighteen gas vents were installed to vent gases underlying the synthetic cover. The sand used as final cover has eroded into the adjacent wetlands, but sampling indicated no contamination was present. Low levels of VOCs and metals including lead, cadmium, and arsenic were discovered in downgradient ground water samples, but levels were sporatic and all were below MCLs. This remedial action will upgrade the existing landfill enclosure to protect ground water and wetlands, implement wetlands recovery operations, and collect and treat landfill gas to reduce risks to public health from inhalation. Primary contaminants of concern affecting the air are hydrogen sulfide and methane gases contaminated with VOCs including benzene, toluene, PCE, and TCE.

The selected remedial action for this site includes: access restrictions; stabilization of the steep side slopes of the landfill and installation of a RCRA cap over the entire landfill, with revegetation; collection and thermal destruction of underlying gases, the method of thermal destruction to be determined in design; excavation of eroded landfill sand from the wetlands, with replacement onsite, and vegetation of excavated wetland areas; and ground water and air monitoring. The estimated present worth cost of the selected remedy is between $5,674,000 and $6,790,000, depending on the particular method of slope remediation and thermal destruction chosen. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Thermal destruction of landfill gases will meet the Rhode Island Air Toxic Regulations at the site boundary.

LANDFILL & RESOURCE RECOVERY, RI
First Remedial Action - Final
September 29, 1988

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Benzene; Clean Air Act; Clean Water Act; Ground Water Monitoring; Incineration; Landfill Closure; Onsite Containment; RCRA; RCRA Closure Requirements; State Criteria; Treatibility Studies; Treatment Technology; VOCs; Wetlands.

LAUREL PARK, CT
First Remedial Action - Final
June 30, 1988

ROD ABSTRACT

The Laurel Park site is located in the town of Naugatuck, New Haven County, Connecticut. The landfill, occupying about 19-acres of the 35-acre site, lies entirely within the drainage basin of the Naugatuck River. Additionally, the landfill is located on a hill in close proximity to fractured bedrock and bedrock aquifer. It is assumed that waste disposal actions began in the late 1940s. It was common practice to burn some of the waste brought to the site. Operational problems at the landfill were reported in the early 1960s. Complaints included chemical spills on roads leading to the landfill, large quantities of black acid smoke, odors, and blowing litter. In 1961, a lawsuit was filed and, in 1964, the owner was ordered to cease burning certain waste types. Between 1965 and 1966, the Connecticut State Department of Health investigated reports of contaminated surface water. Construction of a leachate collection system was completed in 1984. The operators of Laurel Park were ordered in January 1981 to stop landfilling in an unapproved excavation area. By April 1987, the landfill ceased receiving wastes. The primary contaminants of concern affecting ground water, soil, surface water, and sediments include: VOCs, organics, and metals.

The selected remedial action for this site includes: installation of a RCRA cap over all waste disposal areas; rehabilitation of existing leachate collection system, supplemented by a shallow ground water extraction system consisting of a French drain and/or ground water extraction wells, with discharge and offsite treatment at the Naugatuck Water Pollution Control Facility (NWPCF); and monitoring of all media. The estimated present worth cost for this remedial action is $21,706,300 without pretreatment, or $23,078,200 including pretreatment, if necessary.

PERFORMANCE STANDARDS OR GOALS: Ground water and leachate will be extracted to meet the RCRA Ground Water Protection Standard (GWPS) at the point of compliance, which is the vertical surface located at the hydraulically downgradient limit of the waste management area. Currently, the GWPS is set at the MCLs, ACLs, or background. Specific individual cleanup levels were not specified.

INSTITUTIONAL CONTROLS: Institutional controls have been recommended to prevent the bedrock aquifer in the site vicinity from being used as a source of water for any purpose.

KEYWORDS: ARARs; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Institutional Controls; Leachate Collection Treatment; Metals; O&M; Offsite Treatment; Onsite Disposal; Organics; Public Exposure; Publicly Owned Treatment Works; RCRA; Safe Drinking Water Act; Sediments; Soil; Surface Water; VOCs.

OLD SPRINGFIELD LANDFILL, VT
First Remedial Action
September 22, 1988

ROD ABSTRACT

The Old Springfield Landfill site is located approximately one mile southwest of the city center in Springfield, Windsor County, Vermont. The land use within a 1 mile radius of the 27-acre site is primarily low density residential housing, light agriculture, undeveloped forest land, and commercial development. The landfill was operated by the Town of Springfield between 1947 and 1968 for the disposal of municipal solid waste and hazardous industrial liquid and semi-liquid waste. The site is currently owned by Springfield Mobile Home Estates, which operates a trailer park currently consisting of 38 mobile homes. Approximately 60 people reside in the Springfield Mobile Estates trailer park, built on top of the landfill. The site first came to the attention of the Vermont Department of Health because of a complaint by a nearby resident of foul-smelling water. Investigation of the site found VOC contamination in a spring and in a residential well near the mobile home park. EPA began investigations at the site in 1976. Four areas of contamination have been identified at the site where industrial waste was either disposed of in discrete trenches or mixed with the municipal waste. This remedial action addresses landfill seepage and ground water contamination. The remedial action is designed for management of contaminant migration and study of final remediation alternatives. The primary contaminants of concern affecting the ground water, surface water, soil, and sediments are VOCs including benzene, PCE, TCE, toluene, and other organics including PCBs and PAHs.

The selected remedial action for this site includes: construction of an underground collection system to collect leachate; installation of wells for extraction of contaminated ground water; onsite treatment of the collected leachate and extracted ground water, or discharge to the Publicly Owned Treatment Works (POTW) for treatment; institutional controls to restrict the use of ground water that exceeds MCLs; multimedia monitoring; and conducting additional studies to determine the feasibility of isolating waste materials from the ground water (e.g., french drain, slurry wall, or waste removal). The estimated present worth cost for this remedial action is $5,374,000 with annual O&M costs of $173,000.

PERFORMANCE STANDARDS OR GOALS: Cleanup goals for ground water and leachate will attain MCLs, and include benzene 5 ug/l, 1,1-dichloroethene 7 ug/l, trichloroethene 5 ug/l, and vinyl chloride 2 ug/l.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented and enforced to restrict the use of ground water where it may exceed MCLs.

KEYWORDS: Air Monitoring; Air Stripping; ARARs; Benzene; Carcinogenic Compounds; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachate Collection/Treatment; MCLs; O&M; Offsite Discharge; Onsite Treatment; Organics; PAHs; PCBs; PCE; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Surface Water Monitoring; TCE; Toluene; Treatability Studies; VOCs; Woodlands.

ROSE DISPOSAL PIT, MA
First Remedial Action - Final
September 23, 1988

ROD ABSTRACT

The Rose Disposal Pit site occupies 1.5 acres in the northern section of a 14-acre residential lot located in Lanesborough, Massachusetts, approximately 4 miles north of Pittsfield. The property encompassing the site is bounded on the north, northeast and west by forests, on the east and southeast by cropland and pasture, and on the southwest by a residential area. There is a small wetland west of the disposal area and a larger forested wetland to the southeast of the property. A small man-made pond is located approximately 200 feet south of the disposal area. During the 1950s and possibly later, the General Electric Company disposed of waste oils and solvents in a trench on the site, now referred to as the disposal area. Field investigations conducted between 1981 and 1986 revealed high concentrations of PCBs in surface and subsurface soils and indicated the presence of VOCs in ground water. The volume of contaminated soil to be remediated is approximately 15,000 yd^3. The primary contaminants of concern affecting the soil, sediments, ground water, and surface water are VOCs including PCE, TCE, toluene, and xylenes, and other organics including PCBs.

The selected remedial action for this site includes: excavation and onsite incineration of approximately 15,000 yd^3 of contaminated soil and sediment with residue disposal onsite; ground water pump and treatment onsite using air stripping and carbon adsorption with discharge to the aquifer; installation of a bedrock well to prohibit ground water migration; treatment of pond sediments and surface water and subsequent restoration of the onsite pond to its original wetlands character; implementation of institutional controls; and ground water monitoring. The estimated present worth cost for this remedial action is $6,450,000 with estimated present worth O&M of $5,790,000.

PERFORMANCE STANDARDS OR GOALS: PCB-contaminated soil above 13 mg/kg (based on 10^{-5} risk level) will be excavated and treated to a PCB concentration of less than 2 mg/kg. Treated ground water will achieve MCLs, if available, or MCLGs, Lifetime Health Advisory (LHA) or a 10^{-6} cancer risk level. Individual ground water cleanup goals include PCE 1 ug/l (10^{-6} risk level), benzene (MCL), and TCE (MCL).

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to prevent ground water use and excavation within the disposal area.

KEYWORDS: Air Stripping; ARARs; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Institutional Controls; MCLs; MCLGs; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; PCBs; PCE; Plume Management; RCRA; Safe Drinking Water Act; Sediments; Soil; Surface Water; TCE; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

YAWORSKI LAGOON, CT
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The Yaworski Lagoon site is a dewatered and backfilled lagoon, approximately 700 feet and 300 feet wide, and surrounded by an earthen dike. It is located on an approximately 100-acre section of land in Canterbury Township, Windham County, Connecticut, on the floodplain of and bordered on the north, south and west by the Quinebaug River. The area surrounding the site includes agricultural land to the east and south. Leachate enters the ground water from below the lagoon; seepage from the lagoon dikes and surface runoff from the site flow to adjacent wetlands. Approximately 2000 feet southeast of the site is an operating solid waste landfill owned by James Yaworski, the same person who operated the lagoon. The landfill contributes some contamination to ground water, but EPA monitored the site in 1988 and determined the contamination to be much less than from the lagoon. Between 1950 and 1973, sludge materials and drums of industrial waste including solvents, paint, textile dyes, acids, resins, and other debris, about 50,000 barrels of waste material altogether, were deposited in the lagoon. The lagoon currently contains approximately 65,000 cubic yards of contaminated sludge covered by about 60,000 cubic yards of contaminated debris. The sludge is a mixture of water, dirt, VOCs, and other organic compounds at concentrations above 10,000 ppm. Metals are at concentrations above 1000 ppm. Monitoring wells were installed at the site in 1976 and ground water contamination was detected. In 1982, following an investigation of the site, CT DEP ordered Yaworski to close the lagoon. The primary contaminants of concern affecting the ground water, soil and sediments are VOCs including benzene, toluene and xylenes, organics including PAHs, and metals including chromium and lead.

The selected remedial action for this site includes: installation of a RCRA cap; improvement of dike around the lagoon to ensure protection from floods; establishment of a ground water protection standard (ACL); and monitoring of ground water for 30 years. A ground water treatment method will be established as part of a corrective action program if, after implementation of the source control remedy, ground water contamination remains above ACLs. The estimated capital cost of this remedial action is $1,673,000 with present worth O&M of $716,600.

PERFORMANCE STANDARDS OR GOALS: Ground water ACLs will be established as part of the selected remedy. Individual ACLs were not specified.

INSTITUTIONAL CONTROLS: Restrictions will be implemented to restrict ground water use onsite and within 1500 feet offsite.

KEYWORDS: Acids; ACL; ARARs; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Flood Plain; Ground Water; Ground Water Monitoring; Inorganics; Lead; Metals; O&M; Organics/VOCs; Plume Management; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Sediments; Sludge; Soil; Solvents; Toluene; VOCs; Wetlands.

AMERICAN THERMOSTAT, NY
First Remedial Action
January 7, 1988

ROD ABSTRACT

The American Thermostat Corporation (ATC) site, occupying approximately eight acres, is located in South Cairo, New York. Private homes are near the site on its eastern and western boundaries. Former plant operations involving the assembly of thermostats for small appliances were carried out in one existing large building. From the mid 1950s through at least 1981, waste containing TCE and PCE sludges were poured down drains which were connected to an abandoned septic system and dumped outside onto plant grounds. The drains were connected to the abandoned septic system. In March 1981, two ATC employees were observed dumping solvents on plant property. This triggered investigations into the company's waste handling practices by the New York State Department of Environmental Conservation (NYSDEC) and the New York State Attorney General's office. Subsequently, water samples collected in five privately-owned wells in the ATC vicinity revealed the presence of high levels of TCE and PCE. As a result, ATC began supplying bottled water to local residents in April 1981. By late 1982, ATC had installed carbon filters on its own well and the affected residential wells. Pursuant to a 1983 Consent Order, ATC and AMRO Realty Corporation (AMRO), the owners of the property, agreed to clean up the site and its surroundings; supply bottled water for cooking and drinking purposes; and install, monitor, and maintain carbon filter systems for the five affected homes. ATC and AMRO did not fully comply with the Consent Order and did not remedy the contamination at the site. In June 1983, a new onsite 4,500-gallon septic system was installed and, in September 1983, ATC provided carbon filtration for septic system discharges to lower PCE levels. ATC ceased operations in May 1985 and filed involuntary bankruptcy. EPA has been sampling area wells and maintaining previously installed carbon filtration units. In addition, EPA installed two new carbon filtration units on contaminated private wells; installed two air stripping system on a highly contaminated well; and drilled a new well attempting to locate a clean water supply. The primary contaminants of concern affecting the ground water are VOCs including PCE and TCE.

The selected remedial action for this site includes: provision of an alternate water supply through extension of the existing Catskill Water District pipeline from Sandy Plains Road or from Rudolph Weir Road to the affected and potentially affected area. The exact route of the pipeline will be determined during design. The estimated capital cost for this remedial action ranges from $2,270,000 to $2,380,000 with annual O&M of $100,000 to $110,000, pending the pipeline route decision.

AMERICAN THERMOSTAT, NY
First Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: This first operable unit will meet the MCLs for TCE 0.005 mg/l, 1,1-dichloroethylene 0.007 ug/l, and 1,1,1-trichloroethane 0.200 mg/l, and the Water Quality Criteria chronic level for PCE of 0.800 mg/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; ARARs; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; MCLs; PCE; Safe Drinking Water Act; State Guidance; TCE; VOCs; Water Quality Criteria.

ASBESTOS DUMP, NJ
First Remedial Action
September 30, 1988

ROD ABSTRACT

The Asbestos Dump site is an 11-acre commercial property, formerly an asbestos processing plant, in Millington, New Jersey. It is bounded by the Passaic River, the Millington Train Station, commercial properties, and private residences. Part of the site lies within the flood plain of the Passaic River which serves as a public water supply source for 74,000 people. Approximately 200 individuals are employed by 21 businesses operating on the active portion of the site. Asbestos, Limited engaged in the fiberization and sale of asbestos at the site from 1927 until 1946. From 1946 until 1953, the plant was owned by Bernard E. Smith and operated under the name of Smith Asbestos, Inc., a manufacturer of asbestos roofing and siding. During these years waste water from the manufacturing process was impounded on the site to permit settling of asbestos fibers suspended in the water. Periodically, the sediment was removed, disposed of onsite and covered with dirt. In May 1953, the property was acquired by National Gypsum, which manufactured cement asbestos siding and roofing sheets at the plant until 1975. Most of the waste was recaptured and recycled during this period, although broken siding and asbestos fibers were dumped on a five-acre area on the property. From 1959 until 1972, National Gypsum used phenylmercuric acetate (PMA) as a fungicide to coat the asbestos shingles. Waste generated by the cleaning of coating equipment was disposed of in small pits onsite. In May 1975, National Gypsum closed the Millington plant. The total asbestos waste at the site is estimated to be 90,000 cubic yards. The primary contaminant of concern affecting ground water and soil is asbestos.

The selected remedial action for this site includes: installation of a two-foot soil cover on areas of exposed or minimally covered asbestos, construction of slope protection/stabilization measures along the asbestos mound embankment, and surface run-off diversion channels on top of asbestos mound; long-term monitoring including offsite ground water monitoring; access restrictions; institutional controls to restrict onsite ground water use and limit development on the asbestos fill area; and performance of treatability studies to evaluate technologies that may permanently remediate asbestos. The estimated present worth cost for this remedial action is $1,145,000 with annual O&M of $56,000 to $161,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedy, covering the asbestos contaminated areas with two feet of soil, will comply with the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) requirements of the Clean Air Act.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to prevent onsite ground water use and development on the asbestos fill areas.

KEYWORDS: Air; ARARs; Asbestos; Clean Air Act; Containment; Ground Water Monitoring; Institutional Controls; O&M; Onsite Containment; Public Exposure; Soil; State Criteria.

BEACHWOOD/BERKELEY WELL, NJ
First Remedial Action - Final
June 30, 1988

ROD ABSTRACT

The Beachwood/Berkeley Well site, encompasses Beachwood Borough and Berkeley Township in central-east Ocean City, NJ. The total population of the two municipalities is approximately 23,000. In response to a public complaint of possible aluminum contamination of drinking water, the New Jersey Department of Environmental Protection (NJDEP) sampled four potable wells and discovered the presence of lead in exceedance of the Federal Interim Primary Drinking Water Standard. Subsequent sampling confirmed the presence of lead at approximately 4 times the standard. The Ocean County Health Department, collected additional samples in the two municipalities. Results of analyses indicated that 15 percent of the total wells sampled in the Borough and 3 percent of the residential wells sampled in the Township exceeded the regulatory standard for lead in drinking water, however, there was no distinct geographical pattern to the occurrence of the lead contamination. By order of the NJDEP, an alternate supply of water was provided to the affected residents. After extensive investigation of lead levels in residential tap water, surface water, ground water, sediments, soils, and lead concentrations in, and dissolution from plumbing systems, it was concluded that elevated concentrations of lead in drinking water were not caused by man-made or industrial sources. Rather, the sources of lead include; a minor contribution from native area ground water, lead packers used in well construction, and dissolution of lead from lead-bearing materials of home plumbing systems, particularly lead/tin solder.

Remediation under the Superfund program of the documented existence of lead in drinking water resulting from dissolution from residential plumbing systems is precluded by law. The State of New Jersey is proceeding independently of Federal Superfund financing to address the presence of and the problems posed by lead in drinking water.

PERFORMANCE STANDARDS OR GOALS: Remediation involves the interim remedy waiver for contaminant-specific ARARs; however, ground water extraction and discharge will meet MCLs. Individual MCL goals were not specified.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

BREWSTER WELL FIELD, NY
Second Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The Brewster Well Field consists of two municipal well fields, No. 1 and No. 2, located on the northern bank of the East Branch Croton River, 3/4 of a mile east of the Village of Brewster, Town of Southeast in Putnam, New York. The 18 shallow wells in the field are a source of water for the municipal water system that serves over 2,100 residents in the Village of Brewster and the Town of Southeast, as well as a number of businesses and a railyard. Additional receptors of the ground water from this aquifer include downstream users of the East Branch Croton River, which contributes to the Croton Falls Reservoir approximately 3.5 miles downstream. Also, two reservoirs exist upstream to the east and northeast within 3000 feet of the site, which are part of New York City's Croton watershed reservoir system. Land use to the north and west is predominantly residential, and to the south commercial and light industrial. VOC contamination was detected in the Brewster Well Field in 1978 and alternate water sources were subsequently added. Investigations identified the source of contamination as a drywell adjacent to the Alben Cleaners south of the site, where dry cleaning wastes wre disposed of via a floor drain until 1983. Approximately 100 yd^3 of material including drywell sludges, sediments, and soil have been contaminated with VOCs at concentrations up to 620,000 ppm. In addition, a plume of ground water contaminated with VOCs at concentrations up to 6,000 ppb extends from the vicinity of the cleaners north to the Brewster Well Field. Consequently, the Village of Brewster and EPA have operated a full scale packed column spray aeration system for treatment of the entire village supply since 1984. The first Record of Decision (ROD) for the site was signed in September 1986 and was aimed at controlling migration of contamination through the ground water. The ROD called for the design and construction of a ground water management system to extract, treat (by air stripping via a packed tower), and reinject ground water to expedite the removal of VOCs. This second ROD is designed to remediate the source of contamination, namely the drywell. The primary contaminants of concern affecting the soil, sediments, sludge and ground water are VOCs including PCE and TCE.

The selected remedial action for this site includes: excavation and offsite incineration of approximately 100 yd^3 of drywell sediments, sludge, and soil with greater than 4 ppm PCE followed by offsite disposal; and removal, decontamination, and offsite disposal of the concrete drywell structure and debris. The estimated capital cost for this remedial action is $241,940.

BREWSTER WELL FIELD, NY
Second Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: Remediation of all soil, sediments, sludge and debris greater than 4 ppm PCE will reduce health risks due to direct contact with contaminated site soils to 1×10^{-6}.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Debris; Direct Contact; Excavation; Incineration; Offsite Disposal; Offsite Treatment; PCE; Public Exposure; RCRA; RCRA Closure Requirements; Sediments; Sludge; Soil; State Criteria; TCE; Treatment Technology; VOCs.

BURNT FLY BOG, NJ
Second Remedial Action
September 29, 1988

ROD ABSTRACT

The Burnt Fly Bog site is located in Marlboro Township, Monmouth County, New Jersey. The site is situated in a rural area with an auto salvage yard and a few scattered residences nearby. The entire Burnt Fly Bog encompasses about 1,700 acres. This remedial action addresses the 10-acre area constituting the Westerly Wetlands Operable Unit. The area is affected by contamination from the 10-acre parcel where waste was originally deposited (Uplands Area Operable Unit). The site includes both flood plains and wetlands. Contamination has been detected in the surface water, surface soil, and the shallow subsurface soil as a result of uncontrolled discharges and runoff from the Uplands Area waste sources. The Uplands Area includes several abandoned oil storage and treatment lagoons containing residual oil sludges and aqueous wastes, contaminated waste piles, and buried or exposed drummed wastes. These are the result of activities at the site from 1950 to 1965. The site property is presently owned by Mr. Dominick Manzo, who operated part of the property as a sanitary landfill from 1963 to 1969. The Uplands Area is currently being cleaned up under a Record of Decision signed on November 16, 1983. The volume of soil contaminated with PCBs and lead is estimated to be 76,400 yd^3 at the site, with an additional 5,600 yd^3 of contaminated sediments in an adjacent downstream area. There is no evidence of PCB contamination in surface water. The primary contaminants of concern affecting the surface water, soil and sediments are PCBs and lead.

The selected remedial action for this site includes: access restrictions; excavation of contaminated sediments from the downstream area with disposal at an offsite RCRA Subtitle C facility; as an interim remedy, containment without capping contaminated soil in the Westerly Wetlands through installation of a sedimentation basin and appropriate diversion controls; and performance of treatability studies on the most promising innovative technology alternatives to provide the final remedy. A subsequent ROD will address this final remedy for the contaminated soil. The estimated present worth cost for this remedial action using a 20-year life estimate is $6,100,000 with annual O&M costs of $320,000.

PERFORMANCE STANDARDS OR GOALS: The excavation of the downstream area sediments meet the State soil cleanup criteria for PCBs 5 mg/kg and lead 250 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Capping; Containment; Direct Contact; Excavation; Flood Plain; Interim Remedy; Lead; Metals; O&M; Offsite Disposal; Organics; PCBs; RCRA; Sediments; Soil; State Criteria; Surface Water; Surface Water Diversion/Collection; Toxic Substances Control Act; Treatability Studies; Wetlands.

EWAN PROPERTY, NJ
First Remedial Action
September 29, 1988

ROD ABSTRACT

The 43-acre Ewan Property site is located in a predominantly agricultural and residential area of Shamong Township, Burlington County, New Jersey. Private residences are provided domestic water from wells as close as one mile downgradient from the site, drawing from an aquifer that extends from beneath the site. The site is broken into two study areas, Area A and Area B. Area A, consisting of nine acres, is the area of concern. Site investigations revealed that during the early to mid-1970s, at least 500 to 8,000 55-gallon drums containing hazardous industrial wastes were disposed of in trenches in Area A, and the trenches were subsequently backfilled with soil. Investigations also revealed that many of the drums are ruptured, corroded or leaking. Soil and ground water samples indicate the presence of VOCs and metals. It is estimated that Area A has 4,500 yd^3 of highly contaminated soil and waste material, and 29,500 yd^3 of moderately contaminated soil. Primary contaminants of concern affecting soil and ground water are VOCs such as benzene, TCE, PCE, and xylenes, and metals including chromium and lead.

The selected remedial action for this site includes: construction of decontamination, staging and waste characterization areas; excavation, staging and characterization of waste materials with offsite incineration of all appropriate wastes (approximately 4,500 yd^3 of buried drums and heavily contaminated soil); temporary onsite storage and assessment of non-incinerable wastes to determine proper disposal method; and monitoring of air and ground water during remedial activities. The estimated present worth cost of the selected remedy is $21,153,000 with estimated annual O&M costs of $22,000.

PERFORMANCE STANDARDS OR GOALS: Will be determined during the remediation of a subsequent operable unit.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Benzene; Chromium; Decontamination; Excavation; Ground Water; Ground Water Monitoring; Incineration; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; PCE; RCRA; Soil; State Criteria; TCE; Temporary Storage Onsite; Treatment Technology; VOCs; Xylenes.

GE WIRING DEVICES, PR
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The GE Wiring Devices site is located in Juana Diaz, Puerto Rico. The General Electric Company (G.E.) owns and operates a five-acre wiring devices plant at this site, which assembled silent mercury switches from 1957 until 1969. Approximately half a ton of mercury was discarded along with 4,000 yd^3 of defective switch parts and plastic scraps in an onsite waste-fill area about 1 acre in area and 1 to 4 feet deep. Several residences are located approximately 400 feet south of the waste-fill area, which is surrounded by a concrete retaining wall and a fence. Ground water in the area is used as a source of drinking water with a public supply well located approximately 1,500 feet west of the waste-fill area. In addition, ground water flows to the west toward the San Jacaquas River. About 500,000 gallons of perched water has accumulated within the waste-fill area as a result of precipitation/recharge. Evidence indicates that contamination of the water table is occurring due to the migration of perch water through the clay layer that exists beneath the waste-fill area. Approximately 1,500 yd^3 of near-surface soil south and downgradient of the waste-fill area has been contaminated by mercury primarily as a result of previous surface runoff from the plant area. The primary contaminant of concern affecting the ground water, soil, and debris is mercury.

The selected remedial action for this site includes: onsite hydrometallurgical treatment of the waste-fill materials, perched water, and contaminated near-surface soil with disposal of the treatment residue in the former waste-fill area, followed by covering with a clean soil cover, and onsite treatment of the process leaching agent with discharge to a POTW; additional investigation of the ground water to determine the extent of contamination; and limited ground water monitoring, provided there is no need for ground water remediation. The estimated capital cost for this remedial action is $1,912,870. There are no O&M costs associated with this remedy.

PERFORMANCE STANDARDS OR GOALS: Soil, perched water, and debris will be treated to a health-based cleanup level of either 16 ppm, if further air sampling verifies levels exceeding the EPA National Emission Standard for a Hazardous Pollutant (NESHAP), or 21 ppb, based on risk due to ingestion, if there are no levels exceeding NESHAP.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; ARARs; Capping; Clean Closure; Debris; Direct Contact; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Metals; Offsite Discharge; Onsite Disposal; Onsite Treatment; Publicly Owned Treatment Works (POTW); RCRA; Soil; Treatability Studies; Treatment Technology.

KIN-BUC LANDFILL, NJ
First Remedial Action
September 30, 1988

ROD ABSTRACT

The 220-acre Kin-Buc Landfill consists of a number of inactive industrial and municipal waste disposal areas and is located in the Raritan River 100-year flood plain and within a coastal zone in Edison Township, Middlesex County, New Jersey. Bordering the site is an industrial park directly north, the Edison Township Municipal Landfill 600 feet to the south, marshlands to the east, and the Raritan River bordering the west. Land use within one mile of the site includes residential, light industrial, and recreational areas. Landfill operations were conducted between 1947 and 1977. Details on the owners/operators of the side are unknown prior 1968 when Kin-Buc, Inc. leased the area from Inmar Associates. According to site records, an estimated 70 million gallons of liquid wastes, including 3 million gallons of oily waste and over 1 million tons of solid waste, were disposed of between 1973 and 1976 alone. Examples of wastes received include solvents, waste oils, paint sludges, cyanides, metal stripping wastes and paint thinners. The Kin-Buc site includes three major mounds: Kin-Buc I (30 acres), Kin-Buc II (12 acres) which lies directly north of Kin-Buc I, and Mound B (9 acres) which lies southwest of Kin-Buc I adjacent to the Raritan River. Additionally, three pits of black oily leachate, Pits A, B, and C, are located at the southeastern edge of Kin-Buc I; there is a refuse-filled low-lying area between Kin-Buc I and the Edison Landfill; and an area of impounded, tidally affected water, Pool C, contaminated by Kin-Buc I is adjacent to the pits. Site activities included burying and compacting contained wastes in Kin-Buc II, and discharging hazardous liquid wastes into bulldozed pits at the top of Kin-Buc I. These practices resulted in numerous citizen complaints, caused frequent major onsite fires and a number of serious occupational injuries. EPA began investigations in January 1976 and detected the discharge of hazardous substances from the facility. In February 1980, EPA began cleanup activities consisting of collection, treatment, and disposal of Pool C leachate; a drum reduction program; oily-phase leachate collection and onsite storage; and aqueous-phase leachate pretreatment, removal, and offsite treatment. In September 1980, Kin-Buc, Inc. was ordered to cap Kin-Buc I and II. This source control ROD addresses remediation of the first of two operable units, which includes Kin-Buc I and II, Pool C, and the low-lying area between Kin-Buc I and Edison Landfill. A subsequent ROD will address offsite migration controls. The primary contaminants of concern affecting the ground water, surface water, sediments, soil and air are: VOCs including benzene and toluene, other organics including PAHs and PCBs, and metals including arsenic and lead.

The selected remedial action for this site includes: installation of a slurry wall surrounding the site; RCRA capping over Kin-Buc II, a portion of the low-lying area between Kin-Buc I and the Edison Landfill, and Pool C; maintenance and upgrading, if necessary, of the Kin-Buc I cap; collection of approximately 3 million gallons of oily-phase leachate with offsite incineration and residual disposal; collection and onsite biological or

KIN-BUC LANDFILL, NJ
First Remedial Action
(Continued)

carbon treatment of aqueous-phase leachate and contaminated ground water with discharge either to surface water or POTW, and dewatering of residual sludges and offsite disposal; ground water monitoring; and O&M. The estimated present worth cost for this remedial action is between $16,290,000 and $16,635,000 with annual O&M varying from $848,000 (year 1) to $405,000 (years 12-20).

PERFORMANCE STANDARDS OR GOALS: Incineration of oily-phase leachate will meet six nines (99.9999%) destruction and removal efficiency. Aqueous-phase leachate and contaminated ground water discharge criteria will be established by NJDEP based on the results of treatability studies, but will meet NJAC water quality criteria and wastewater discharge requirements. Individual cleanup goals were not specified.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict use of the property as necessary to prevent damage to the cover.

KEYWORDS: Air; ARARs; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Containment; Direct Contact; Flood Plain; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; Lead; Metals; Offsite Discharge; Offsite Disposal; Offsite Treatment; O&M; Onsite Treatment; Organics; PAHs; PCBs; Publicly Owned Treatment Works (POTW); RCRA; RCRA Closure Requirements; Sediments; Slurry Wall; Soil; Solvents; State Criteria; State Permit; Surface Water; Toluene; Treatability Studies; Treatment Technology; VOCs.

LIPARI LANDFILL, NJ
Third Remedial Action - Final
July 11, 1988

ROD ABSTRACT

The Lipari Landfill site is a municipal and industrial waste landfill in Mantua Township, Gloucester County, New Jersey. The landfill consists of an "onsite" and an "offsite" portion. The onsite portion is a formerly active landfilling area that consists of a slurry wall/synthetic membrane containment system. This portion was addressed in a previous remedial action. A separate previous remedial action focused on flushing water-transportable contaminants from within the containment system. This remedial action addresses the offsite portion of the site which is the area outside of the encapsulation system consisting of agricultural and residential areas that include several lakes, streams, and parks. The site is bordered by the Zee Orchard on the north and west, and a housing development on the northeast. The site property was purchased by Mr. Nicholas Lipari in 1958 and was used until 1971 for excavation of sand and gravel and landfilling of municipal and household wastes, liquid and semi-solid chemical wastes, and other industrial wastes. Offsite investigations indicate that lakes, streams, and marshland in the area surrounding the site have been impacted by contaminant migration from the landfill. The primary contaminants of concern affecting the ground water, surface water, sediments, soil and air are VOCs including benzene, toluene, and xylene, and metals including arsenic, chromium, and lead.

The selected remedial action for the offsite areas includes: collection of the contaminated ground water/leachate, followed by onsite treatment and discharge to POTW; excavation of contaminated marsh soil, and dredging and dewatering contaminated sediments, followed by thermal treatment and offsite disposal as nonhazardous material; integration of offsite sampling with the onsite monitoring plan being developed to monitor the effectiveness of the onsite flushing action; and temporary remedial measures in the surrounding marshland, if necessary, to mitigate volatile emissions from leachate seepage areas. The estimated present worth cost for this remedial action is $21,000,000. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup will attain the New Jersey soil cleanup objectives developed under the Environmental Cleanup and Responsibility Act (ECRA) and health or risk-based criteria. Surface water cleanup will meet Federal and State Water Quality Criteria and surface water standards. Individual contaminant goals were not provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; ARARs; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Dredging; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Leachate Collection/Treatment; Lead; Metals; Offsite Discharge; Offsite Disposal; O&M; Onsite Treatment; Organics; Public Exposure; Publicly Owned Treatment Works (POTW); RCRA; Sediments; Soil; State Criteria; Surface Water; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Wetlands; Xylenes.

LOVE CANAL, NY
Second Remedial Action
October 26, 1987

ROD ABSTRACT

The Love Canal site is located in the southeast corner of the city of Niagara Falls, New York and is approximately one-quarter mile north of the Niagara River. The canal was one of two initial excavations designed to provide inexpensive hydroelectric power for industrial development around the turn of the 20th century. Hooker Chemicals and Plastics Corporation (Hooker), now Occidental Chemical Corporation, disposed of over 21,000 tons of chemical wastes, including dioxin tainted trichlorophenols, into Love Canal between 1942 and 1953. In the mid to late 1970s, continued periods of high precipitation contributed to water accumulation in the disposal area causing chemically-contaminated leachate to be carried to the surface and into contact with residential basement foundations. Also, dioxin and other contaminants migrated from Love Canal to the sewers which have outfalls to nearby creeks. The remedial program at Love Canal has been extensive and has occurred in two phases. Phase one consisted of measures aimed at site containment. Phase two has been directed at remediating contaminated drainage tracts, including nearby creek and sewer sediments are contaminated with 2,3,7,8-tetrachlorodibenzo-p-dioxin, commonly referred to as dioxin. The 1985 remedial action called for the removal of contaminated sediments from the creeks and sewers, followed by interim storage in an on-site containment facility. This remedial action requires the removal of approximately 15,000 yd^3 and 1,000 yd^3 of creek and sewer sediments respectively, as well as associated contaminated debris from remediation.

The selected remedial action for this site includes: construction of an onsite creek sediments dewatering/containment facility (DCF) to include a separate construction/demolition debris facility (CDF); onsite thermal destruction of the stored creek and sewer sediments and associated remedial waste stored in the DCF; thermal destruction of leachate treatment residuals and other dioxin contaminated material derived from site remediations; onsite storage of uncontaminated debris in the CDF; onsite disposal of non-hazardous thermal treatment residuals in a manner that avoids disturbance of the existing cap; and scaling down of the DCF to only include the construction/demolition debris material. An estimated 25,000-35,000 yd^3 of dioxin contaminated material will require thermal destruction. The estimated present worth cost for this remedial action ranges from $26,400,000 to $31,400,000.

PERFORMANCE STANDARDS OR GOALS: The Centers for Disease Control have generally applied a 1 ug/kg level of concern for dioxin in residential soils for other areas in the country. A technical review determined that separation and consolidation of the dioxin-contaminated sediments above 1 ug/kg is not implementable and would lead to unacceptable project delays. In addition, the community is opposed to any remedial alternative that does not call for thermal destruction of all the contaminated creek and sewer sediments. As a result, all materials (excluding 5,500 yd^3 of house

LOVE CANAL, NY
Second Remedial Action
(Continued)

debris) will be thermally treated. Six nines (99.9999%) destruction and removal efficiency will be the performance standard. In addition, excavation to approximately 18 inches will ensure the elimination or reduction of risk. (Creek sediment contamination only detected to a depth of 12 inches).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Debris; Dioxin; Direct Contact; Incineration; Onsite Treatment; Pesticides; Public Exposure; RCRA; Sediments; State Criteria; Treatment Technology.

LOVE CANAL/93rd STREET SCHOOL, NY
Third Remedial Action
September 26, 1988

ROD ABSTRACT

The Love Canal/93rd Street School site consists of approximately 19 acres and includes a school and an adjacent vacant lot. The site is located in Niagara Falls, New York, less than one mile northwest of Love Canal and is within the Love Canal Emergency Declaration Area. It is bordered by Bergholtz Creek to the north and residential properties to the east, west and south. A small area east of the school and adjacent to Bergholtz Creek is within a 100-year flood plain. Hooker Chemicals and Plastics Corporation disposed of over 21,000 tons of various chemicals at the Love Canal site from 1942 to 1953, when the site was deeded over to the City of Niagara Falls Board of Education. Sampling has revealed that approximately 6,000 yd^3 of soil are contaminated. During the 1950s, home construction accelerated in the area. Specifically, in 1950, the 93rd Street School was built, and in 1954, the 99th Street School was built adjacent to the middle portion of the Canal. Prior to construction of the 93rd Street School, a drainage swale crossed the site. Between 1938 and 1951, the swale was partially filled with soil and rock debris, followed by sand and fly ash materials. In 1954, the site was graded to its present contours with approximately 3,000 yd^3 of fill material, including fill from the 99th Street School. The fill material is reported to contain fly ash and BHC (pesticide) waste. In 1980, the 93rd Street school was closed due to public health concerns related to the potentially contaminated fill material. The primary contaminants of concern affecting soil are VOCs, including toluene and xylenes, other organics including dioxins, PAHs and pesticides, and metals including arsenic and lead.

The selected remedial action for this site includes: excavation and solidification/stabilization of 7,500 yd^3 of soil; placement of solidified soil back in excavated location; installation of a RCRA cap; ground water monitoring; and implementation of treatability studies for solidification process. The estimated capital cost for this remedial action is $2,295,000 to $3,675,000 with estimated annual O&M of $121,000.

PERFORMANCE STANDARDS OR GOALS: This remedy will permanently immobilize soil which poses an unacceptable carcinogenic risk. Specifically, all excavated soil will be treated to meet the Land Disposal Restrictions requirements for dioxin of less than 1 ug/l, as measured in the soil leachate by the TCLP test.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Arsenic; Capping; Dioxin; Direct Contact; Flood Plain; Ground Water Monitoring; Landfill Closure; Leachability Tests; Lead; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; Pesticides; RCRA Closure Requirements; Soil; Solidification/Stabilization; Toluene; Treatment Technology; VOCs; Xylenes.

LUDLOW SAND AND GRAVEL, NY
First Remedial Action
September 30, 1988

ROD ABSTRACT

The Ludlow Sand and Gravel site is located approximately six miles south of Utica, in the town of Paris, Oneida County, New York. The site consists of a gravel pit and landfill on a 130-acre tract of land, owned and operated by Mr. James Ludlow. It is surrounded by rural residential and agricultural land and includes a New York State designated wetland south and east of the fill area. The landfill, which is the focus of this ROD, is in a ground water recharge zone to the principal aquifer along Sauquoit Creek. Fill material is in contact with the ground water in some locations in the landfill. Sauquoit Creek serves as a major discharge point for ground water flowing from this aquifer. Various organizations and individuals have disposed of waste at the site since 1966. This waste included domestic wastes, septic tank effluent, industrial wastes such as dyes, waste oils and metallurgical cooling oils, and animal parts from a meat processing plant. In late 1982, sampling revealed traces of PCB contamination in the leachate pools on the southern portion of the property. In July 1987, the District Court of Binghamton ordered Mr. Ludlow to cease operations at the site. Mr. Ludlow complied with the court order and closed the landfill by February 15, 1988. The primary contaminants of concern affecting soil, sediments and ground water are VOCs including benzene and toluene and organics including PCBs and phenols.

The selected remedial action for this site includes: consolidation and onsite disposal into the landfill of approximately 10,000 yd^3 of contaminated soil and sediment adjacent to the landfill, and installation of an impermeable cover over the landfill; collection of leachate from seepage areas formed from the landfill and dewatering of the landfill through use of a passive drain system or an active well system with onsite treatment of the collected leachate/ground water and offsite discharge of the effluent, or, if dewatering is not implemented, collection and transportation of leachate offsite to a permitted disposal facility; implementation of upgradient ground water controls to lower and prevent the ground water table from coming in contact with the waste material; access restrictions; imposition of deed restrictions governing future use of the property; and implementation of a long-term water quality monitoring program including both onsite and offsite ground water, surface water and potable water supply wells. A second remedial action will address ground water remediation, if necessary. This remedial action is a combination of three alternative remedies. The present worth is estimated to be between $3,727,200 and $14,548,900 with an annual O&M between $58,900 and $364,900.

PERFORMANCE STANDARDS OR GOALS: Treated effluent for discharge will meet substantive requirements of the New York State Pollution Discharge Elimination System (6 NYCRR Parts 750-757 and 701.5), Technical Operations Guidance Series (700 1.1.1), Ambient Water Quality Standards and Guidance Values (April 1987), all ground water and surface water standards, and

LUDLOW SAND AND GRAVEL, NY
First Remedial Action
(Continued)

Freshwater Wetlands Standards (6 NY CRR Part 663-665). PCBs will be cleaned up to a level of 10 ppm, as recommended by the TSCA PCB Spill Cleanup Policy Final Rule (40 CFR Part 761).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to control future use of the property.

KEYWORDS: ARARs; Benzene; Capping; Carcinogenic Compounds; Containment; Deed Restriction; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; Offsite Discharge; Offsite Disposal; Onsite Disposal; Onsite Treatment; O&M; Organics; PCBs; Phenols; Public Exposure; RCRA; RCRA Closure Requirements; Sediments; Soil; State Criteria; Surface Water Monitoring; Toluene; Toxic Substances Control Act; VOCs; Wetlands.

MARATHON BATTERY, NY
Second Remedial Action
September 30, 1988

RCD ABSTRACT

The Marathon Battery Company (MBC) site, a former battery manufacturing plant, is located in the Village of Cold Spring in Putnam, New York, approximately 40 miles north of New York City. The area surrounding the site includes the Hudson River to the west, residential areas to the northwest, west, and southwest adjacent to the site, and wetlands including Foundry Cove, which is divided into East Foundry Cove (EFC) and West Foundry Cove, to the south. The site operated from 1952 to 1979 producing military and commercial batteries. During this time the site changed ownership several times, finally operating as the MBC from 1969 to 1979. Before 1965, the plant's wastewater treatment system discharged into the Hudson River at the Cold Spring pier via the Cold Spring sewer system, except during periods of overload or system shutdown during which time the process effluent was discharged directly into East Foundry Cove Marsh (EFCM) to the southeast. In 1965, however, the plant began discharging all of the process effluent into EFCM after the New York State Department of Health concluded that the industrial discharge could not be managed by a new sewage treatment system proposed for the Village of Cold Spring. Between November 1972 and July 1973, a limited cleanup was conducted by MBC and other responsible parties, to remove sediment from parts of Foundry Cove and surrounding areas contaminated with cadmium and nickel in excess of 900 mg/kg. Approximately 5,000 yd^3 of cadmium-contaminated sediments were dredged and subsequently placed in a clay-lined underground vault on the plant property. However, studies conducted in Foundry Cove between 1976 to 1980 continued to detect cadmium and nickel concentrations in excess of 900 mg/kg. To expedite remediation, the site has been divided into three separate geographic areas as follows: Area I, EFCM and Constitution Marsh southeast of the plant; Area II, the 11-acre former battery plant grounds, including the former battery manufacturing facility (presently used as a book repository), a production well, a 500,000 gallon water tower, building debris, a dredge spoils vault, a parking lot, and nearby residential yards; and Area III, EFC and the portion of the Hudson River in the vicinity of the wastewater discharge pipe on Cold Spring pier. A ROD was signed for Area I in September 1986 with cleanup activities to include dredging the EFCM and replacing the sediments with clay and clean fill. This ROD addresses Area II including localized soil contamination primarily in the area around the building, under debris, and around the parking lot; dust inside the building; and the sludge spoils vault. A subsequent ROD will address Area III. The primary contaminants of concern affecting the ground water, soil, debris, and inside surfaces of a building in Area II are: VOCs including PCE and TCE, and metals including cadmium and nickel.

The selected remedial action for Area II at this site includes: decontamination of the inside surfaces and contents of the former battery facility to remove the heavy metal-contaminated dust; excavation of both the cadmium-contaminated soil on the battery plant grounds and nearby residential yards, and the dredge spoils vault, followed by onsite fixation of the excavated soil, dust, and vault sediments and offsite disposal; excavation of the VOC-contaminated soil hotspots followed by enhanced volatilization and replacement of the clean residuals onsite; backfilling of the excavation areas with clean fill; institutional controls; ground water monitoring; and evaluation and performance of minor repairs, if needed, to the inoperable sprinkler and heating systems inside the former battery facility. The estimated present worth cost for this remedial action is $10,010,000, with annual O&M of $775,000 (year 1) and $17,000 (years 2-30).

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals will attain ACLs for indicator compounds that are below federal and state MCLs, if available, and include PCE 0 ug/l and TCE 3 ug/l. These goals will be attained in 3-10 years by natural attenuation. There are no ARARs promulgated for heavy metals; however, excavation of onsite and offsite cadmium-contaminated soils will attain a level of 20 mg/kg.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict the development of the aquifer for potable or municipal use.

KEYWORDS: ACL; ARARs; Carcinogenic Compounds; Debris; Decontamination; Direct Contact; Dredging; Drinking Water Standards; Excavation; Filling; Ground Water; Ground Water Monitoring; Institutional Controls; MCLs; Metals; Offsite Disposal; O&M; Onsite Disposal; Onsite Treatment; Organics; PCE; RCRA; Safe Drinking Water Act; Sediments; Soil; Solidification/Stabilization; State Criteria; TCE; Treatment Technology; VOCs.

MONTGOMERY TOWNSHIP HOUSING DEVELOPMENT, NJ
Second Remedial Action - Final
June 30, 1988

ROD ABSTRACT

The Montgomery Township Housing Development (MTHD) site is located in Somerset County, New Jersey. The Rocky Hill Municipal Wellfield (RHMW) Superfund site is also covered by this remedial action because of its proximity to the MTHD and the similarity of the contaminants present. The 72-acre MTHD site is a development which includes 71 private homes, with an additional 6 homes affected by the contamination in the surrounding residential areas. The RHMW consists of a two-acre tract of land in the Borough of Rocky Hill, which supplies public water to the residents of Rocky Hill. In 1978, a study of the RHMW revealed TCE contamination, which led to closure of one well and eventual installation of an air stripping treatment unit on the well in 1983. Concern over the ground water contamination in Rocky Hill spurred the initial sampling of residential wells in MTHD from December 1979 to January 1980. In March 1981, Elizabethtown Water Company water lines were installed in MTHD, and residents were advised not to use well water. Twenty homes initially elected to connect to the municipal supply, and at the present time 38 residences have hooked up. In September 1987, an operable unit ROD was signed by EPA, which provided for the supply of alternate water through the permanent hookup of all MTHD residences, and six residences outside of MTHD, to the available public water supply system. Field investigations have identified 13 possible sources of contamination. The nearby Princeton Gamma Tech property has been identified as a primary source of TCE contamination in the area. The primary contaminant of concern affecting the ground water is TCE.

The selected remedial action for this site includes: ground water pump and treatment using air stripping and reinjection of the treated water back into the aquifer; connecting any remaining affected residences to the public water supply and sealing of remaining private water supply and monitoring wells within the contaminant plume; and implementation of ground water monitoring. Present worth cost for this remedial action is $2,548,000 with annual O&M costs of $94,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup will attain the State MCC for TCE 1.0 ug/l.

INSTITUTIONAL CONTROLS: Water well use restrictions will be implemented.

KEYWORDS: Air Stripping; Alternate Water Supply; ARARs; Arsenic; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Discharge; Onsite Treatment; Organics; Public Exposure; Safe Drinking Water Act; Solvents; State Criteria; TCE; Treatability Studies; Treatment Technology; VOCs.

NASCOLITE, NJ
First Remedial Action
March 31, 1988

ROD ABSTRACT

The Nascolite site is located in the cities of Millville and Vineland, Cumberland County, New Jersey. The 17.5-acre site is wooded and is in a residentially and industrially zoned area. Several homes exist near the site and rely on potable wells for drinking water. Between 1953 and 1980, the Nascolite Corporation manufactured polymethyl methacrylate (MMA) sheets, commmonly known as plexiglass. Waste residues from the distillation of scrap acrylic, a manufacturing by-product, were stored in buried tanks onsite. Perforations in an excavated tank indicated the possibility of liquid waste leaking into the soils. In 1981 and 1983, the New Jersey Department of Environmental Protection (NJDEP) conducted onsite ground water sampling and found significant concentrations of VOCs. NJDEP identified over 100 fifty-five gallon drums and several buried tanks on the site, most of which have been subsequently removed from the site by the property owner. The remaining drums were removed by EPA. The primary contaminants of concern affecting both ground water and soil include: VOCs, base/neutrals, and MMA.

The selected remedial action for this site includes: ground water pump and treatment using a method determined through pilot testing with reinjection into the aquifer; performance of additional soil and onsite building studies to determine appropriate future remedial measures; and provision of an alternate water supply for potentially affected residents. The estimated captial cost for this remedial action is $609,000 with annual O&M of $266,000.

PERFORMANCE STANDARDS OR GOALS: The ROD did not state specific target concentrations for contaminants; however, it indicated that cleanup goals were developed using the Clean Water Act, Safe Drinking Water Act, Solid Waste Disposal Act, New Jersey Safe Drinking Water Act, and the Ground Water Quality Criteria of the New Jersey Administrative Code. Additionally, for carcinogenic compounds without cleanup standards, the 10^{-6} cancer risk cleanup standard will be used. A goal of 50 ug/l total noncarcinogenic and "non-A-280" compounds were selected for any other contaminants.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; ARARs; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water Treatment; Onsite Discharge; Onsite Treatment; Organics; Public Exposure; Safe Drinking Water Act; Soil; Solid Waste Disposal Act; State Criteria; VOCs.

OLD BETHPAGE, NY
First Remedial Action - Final
March 17, 1988

ROD ABSTRACT

The Old Bethpage landfill, covering approximately 65 acres, is located in Old Bethpage, Town of Oyster Bay, Nassau Country, New York. Two public drinking water wells, a residential community, an industrial park, and a state park, exist within the site's general vicinity. Beginning in 1958, the Town of Oyster Bay operated the landfill as a municipal landfill. In addition to accepting municipal wastes and garbage, local industrial wastes were disposed of on the landfill during the late 1960s and early 1970s. The landfill ceased operations in April 1986. A system designed to collect, store, treat, and dispose of leachate has been operating at the site since 1983. There are three remedial actions currently underway at the site. They include: leachate collection, methane gas collection, and landfill capping. The methane gas collection system was installed in phases in 1982 at the periphery of the site to monitor and prevent migration of gas beyond the property boundary. The 18-inch thick clay cap was applied to 29 acres of the landfill. These actions were described in the October 1983 Comprehensive Land Use and Operations Plan prepared in accordance with State landfill closure regulations. The primary contaminants of concern affecting ground water include: VOCs, TCE, benzene, toluene, inorganics, chromium, and lead. Air is contaminated with methane gas and VOCs.

The selected remedial action for this site includes: hydraulic control of the plume through installation of ground water recovery wells; ground water pump and treatment using air stripping and, if necessary, carbon filtration with discharge into an upgradient injection well system; ground water monitoring; completion of the landfill capping (29 acres previously capped); continuation and expansion, or enhancement of the leachate control and gas collection systems; and gas monitoring. The estimated present worth cost of this remedial action is $23,045,000.

PERFORMANCE STANDARDS OR GOALS: The plume will be cleaned to New York State Department of Environmental Conservation (NYSDEC) Standards and Guidances, and Technical and Operational Guidance Series, or to a zero-slope condition, if one exists following 5 or more years of pumping and the application of requisite remedial technology. If additional compounds should be detected (currently 17 inorganics and 25 VOCs specified), the most stringent of the requirements obtained from these sources shall apply. For any VOC without a State value, the applicable limit shall be 50 ug/l. Some individual goals for ground water include: chromium 0.05 mg/l, lead 0.025 mg/l, TCE 5.0 mg/l (MCL), benzene-non-detectable, and toluene 50 mg/l. Air discharge requirements will meet NYSDEC Air Guide No. 1. If more stringent Federal National Ambient Air Quality Standards are promulgate, the more stringent standard shall apply. Some individual goals for air (currently 27 specified) include: methylene chloride 1.17×10^3 ug/m^3, TCE 9.0×10^2 ug/m^3, benzene 1.0×10^2 ug/m^3, and toluene 7.5×10^3 ug/m^3.

OLD BETHPAGE, NY
First Remedial Action - Final
(Continued)

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Air Stripping; ARARs; Capping; Carcinogenic Compounds; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; MCLs; O&M; Onsite Disposal; Organics; Plume Management; Safe Drinking Water Act; State Criteria; TCE; VOCs.

REICH FARM, NJ
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Reich Farm site is located in Dover Township, Ocean County, New Jersey. The three-acre site is bounded by commercial establishments to the west and wooded areas in all other directions. The site is approximately one mile northeast of the Toms River, but no floodplains or wetlands are affected by the site. The site is currently owned by Mr. and Mrs. Samuel Reich. In August 1971, they rented a portion of their land to Mr. Nicholas Fernicola for temporary storage of used 55-gallon drums. That December, the Reichs discovered approximately 4,500 drums containing wastes and 450 empty drums on that portion of their property. Most of the drums had Union Carbide Corporation (UCC) markings on them, with labels reading "tar pitch," "lab waste solvent," "blend of resin and oil," and "solvent wash of process stream" among others. The site first came to the attention of the New Jersey Superior Court when the Reichs filed suit against Mr. Fernicola and UCC. UCC undertook drum removal and completed the work in March 1972. In June 1974, another 51 drums and approximately 1,100 yd^3 of contaminated soil and trenched wastes were removed from the site, but residents near the site had already complained about unusual taste and odor in their well water. Based on results of an extensive sampling program, the Dover Township Board of Health ordered 148 private wells closed and established a zoning ordinance restricting ground water use in the area of Reich Farm. The volume of contaminated soil remaining at the site is estimated to be 2,010 yd^3. The primary contaminants of concern affecting the ground water and soils are VOCs including 1,1,1-trichloroethane (TCA), TCE, PCE, and semi-volatile organics compounds (SVOCs).

The selected remedial action for this site includes: additional ground water sampling to further delineate the leading edge of the contaminant plume and additional soil sampling to support existing data on contaminants of concern at the site; ground water pump and treatment using air stripping and carbon adsorption with reinjection of the treated water back into the aquifer; excavation and storage of surface soils onsite which do not require remediation; excavation of subsurface soils and onsite treatment by enhanced volatilization and onsite disposal, or shipment of subsurface soils which cannot be treated onsite to an offsite RCRA-permitted facility for incineration and disposal, followed by backfilling excavated areas with clean surface soils. The estimated present worth cost for this remedial action is $5,832,000, which includes annual O&M costs of $419,550.

PERFORMANCE STANDARDS OR GOALS: The cleanup objectives for ground water will meet the more stringent State of New Jersey MCLs for TCA 26 ug/l, TCE 1 ug/l, and PCE 1 ug/l. Cleanup objectives for the soil remediation will meet the New Jersey Department of Environmental Protection Soil Action Levels of 1 mg/kg total VOCs and 10 mg/kg SVOCs.

REICH FARM, NJ
First Remedial Action - Final
September 30, 1988
(Continued)

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Clean Air Act; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Excavation; Filling; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; MCLs; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PCE; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Soil; State Criteria; TCE; Treatability Studies; Treatment Technology; VOCs; Woodlands.

RINGWOOD MINES/LANDFILL, NJ
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The Ringwood Mines/Landfill site consists of approximately 500 acres in a historic mining district in Ringwood Borough, Passaic County, New Jersey. The mines lie west of and adjacent to the Town of Ringwood and one mile northwest of Wanaque Reservoir. The site is characterized by a variety of features including abandoned mine shafts and surface pits, an inactive landfill, an industrial refuse disposal area, small surficial dumps, a municipal recycling area, a municipal garage, and approximately 50 residences. Ground water beneath the site discharges to surface streams and the Wanaque Reservoir. The Ringwood mines are a series of iron ore mines that operated from the mid-1700s to the early 1900s and possibly even later. The site was purchased by the U.S. Government prior to 1940, and later sold to a succession of owners including Ringwood Realty Corporation (RRC), a subsidiary of Ford Motor Company (Ford), in January 1965. Between 1967 and 1974, RRC deposited waste products for Ford, including car parts, solvents, and paint sludges, on the ground surface and in abandoned mine shafts. In 1970, RRC donated 290 acres in the southern portion of the site to Ringwood Solid Waste Management Authority (RSWM), which began operating a permitted municipal disposal area in March 1972. In 1976, the New Jersey Department of Environmental Protection (NJDEP) closed the landfill after determining that leachate emanating from the landfill was contaminating surface water in the area. In July 1982, NJDEP detected moderate levels of VOCs, as well as naturally occurring heavy metals, in ground water in the northern section of the site, which had been retained by RRC and a portion used for industrial waste disposal. The site was subsequently divided into four discrete areas for investigation. Between October 1987 and February 1988, Ford International Services, Inc. conducted a removal action, entailing excavation and offsite disposal of 7,000 yd^3 of surficial paint sludge containing lead and arsenic from four onsite areas. Subsequent sampling, however, indicated that soil within a small area (less than one acre) still contains concentrations of lead and total petroleum hydrocarbons in excess of health-based levels. Furthermore, there is sporadic and moderate ground water contamination, generally confined to paint sludge locations, exceeding MCLs for lead and arsenic. The primary contaminants of concern affecting the soil and ground water are arsenic, lead, and petroleum hydrocarbons.

The selected remedial action for this site includes: confirmatory sampling of soil with excavation and offsite disposal of any soil exceeding health-based levels, followed by backfilling and revegetation; and ground water, surface water and wetlands monitoring. Since ground water in the vicinity of the paint sludge areas in not used as a drinking water source and natural attenuation is expected to reduce contamination levels of below health based levels after removal of the source, ground water will not be treated. The estimated capital cost for this remedial action is $225,000 with annual O&M of $50,000.

RINGWOOD MINES/LANDFILL, NJ
First Remedial Action - Final
September 29, 1988
Continued

PERFORMANCE STANDARDS OR GOALS: Soil cleanup will attain the non-promulgated New Jersey Cleanup Objectives for lead 250 mg/kg and total petroleum hydrocarbons 100 mg/kg. Ground water will attain MCLs, including arsenic 50 ug/l and lead 50 ug/l, by natural attenuation.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Closure; ARARs; Arsenic; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Lead; MCLs; Metals; O&M; Offsite Disposal; Organics; RCRA Closure Requirements; Safe Drinking Water Act; Soil; State Criteria; State Guidance; VOCs.

ROCKY HILL, NJ
First Remedial Action - Final
June 30, 1988

The 2-acre Rocky Hill Municipal Well Field site (RHMW) is located in Montgomery Township, Somerset County, New Jersey. Montgomery Township Housing Development (MTHD), located north of the well field contains 77 private homes. RHMW is listed on both the State and National Registers of Historic Places. Additionally, a nearby corridor has a potential for archaeological significance. Two wells, numbered 1 and 2, were constructed in 1936 to provide a source of potable water to the Borough of Rocky Hill (BRH). A 1978 Rutgers University study revealed TCE contamination levels in Well 1, and it was abandoned and sealed by 1978. Further testing, conducted between 1978 and 1983 revealed cycles of elevated levels of TCE in Well 2. It was closed in November 1979. Declining levels of TCE in the well field resulted in the reopening of the well; however, levels increased and the well was again closed in January of 1982. During the shutdown of Well 2, BRH obtained potable water from the privately-owned Elizabethtown Water Company. After the installation of two air stripping units by the borough, Well 2 reopened as a potable water source. Recently, 38 MTHD residents elected to connect to the municipal supply. The first operable unit ROD, signed in September 1987, provided for the supply of alternate water through the permanent hookup of all remaining MTHD residences and 6 residences outside of MTHD. Approximately 13 possible sources of contamination are under evaluation. TCE is the most predominant site contaminant, both with respect to concentration and areal extent. Several additional components such as chlordane and metals are sporadically present; however, these compounds were not considered to be related to the TCE contamination.

The selected remedial action for this site includes: ground water pump and treatment using air stripping with reinjection; connection of any remaining affected residences to the public water supply; sealing remaining private water supply and monitoring wells within the contamination plume; and implementation of ground water sampling program to monitor the effectiveness of the cleanup. The estimated capital cost for this remedial action is $1,618,000 with annual O&M of $84,000.

PERFORMANCE STANDARDS OR GOALS: The objective of remediation is to reduce the entire ground water concentration of TCE to 1 ug/l. This level is a proposed New Jersey MCL which is expected to be promulgated in the near future. It is being used in place of the federal MCL of 5 ug/l. PCE and 1,1-dichloroethene will be reduced to below 1 ug/l and 2 ug/l, respectively. The remedy will meet a 0.12×10^{-6} excess cancer risk level.

INSTITUTIONAL CONTROLS: In January 1986, the New Jersey Department of Environmental Protection, Division of Water Resources, placed a restriction on future well drilling for water supply wells in the area.

KEYWORDS: Air Stripping; Alternate Water Supply; ARARs; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Onsite Discharge; Onsite Treatment; PCE; State Criteria; TCE; VOCs.

TABERNACLE DRUM DUMP, NJ
First Remedial Action - Final
June 30, 1988

ROD ABSTRACT

The Tabernacle Drum Dump (TDD) site is a one-acre parcel of undeveloped land located in Tabernacle Township, Burlington County, New Jersey. Drum disposal activities, which resulted in contamination by hazardous substances, occurred on a 2,000 ft^2 area portion of the site. Land use in the area consists mainly of woodland, bogs, agriculture, and recreation. The soils typically found in the area are highly permeable, sandy, and acidic. Approximately 75 to 100 residents live within a one-mile radius of the site. Most of the residents located down-gradient of the site depend on individual residential wells for potable and agricultural purposes. TDD is currently owned by Mr. and Mrs. Phillip Myers. In 1976 and 1977, the property was occupied by Mr. and Mrs. Robert Ware. During that period, Mr. Ware's employer, the Atlantic Disposal Services (ADS), disposed of approximately 200 containers, including fifty-five gallon drums, twenty gallon containers, and five gallon paint cans. These containers were stored at the site between 1977 to 1984. Deterioration and leakage of some containers resulted in visible soil contamination and ultimately ground water contamination. Based on a referral from Tabernacle Township officials, the Burlington County Health Department conducted a site inspection in August 1982, and discovered over 100 abandoned drums. In November 1982, the New Jersey Department of Environmental Protection (NJDEP) conducted a more detailed site inspection. Leaking and deteriorated drums containing solvents, paint sludges, heavy metals, and visibly contaminated surface soils were revealed. In 1984, EPA issued an administrative order to ADS requiring it to perform a surface cleanup of the site, install and sample four monitoring wells, and sample and analyze site surface and subsurface soils for priority pollutants. During April 1984, ADS initiated some remedial measures including the numbering, logging, and sampling of site containers. Surface cleanup was completed in July 1984 and consisted of removing containers, 40 yd^3 of drum material, 8 truck loads of excavated soil, and approximately 3,000 gallons of liquid material. The principle threat posed at the site is potential ingestion of ground water by down-gradient residents. The primary contaminants of concern are VOCs including 1,1,1-trichloroethane (TCA) and 1,1-dichloroethene (DCE).

The selected remedial action for this site includes: installation of ground water monitoring wells to further delineate the extent of the plume and implementation of a monitoring program for downgradient residential wells; ground water pump and treatment using air stripping and possibly carbon adsorption followed by reinjection, ground water monitoring, and exhaust gas analysis; and soil sampling of the former drum dumping and storage area. The estimated capital cost for this remedial action is $772,600 with present worth O&M of $215,600.

TABERNACLE DRUM DUMP, NJ
First Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: The proposed MCLs established by NJDEP are more stringent than federal standards and include 1,1,1-TCA 26 ug/l and DCE 2 ug/l. The remedial action will comply with NJDEP levels in anticipation that they will become State ARARs. The levels of contaminants found in the surface soils did not exceed the existing soil ARARs established by NJDEP.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Clean Air Act; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Safe Drinking Water Act; State Criteria; TCE; Treatability Studies; VOCs.

UPJOHN MANUFACTURING COMPANY, PR
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Upjohn Manufacturing Company (UMC) site is located in the Barceloneta industrial park on the north coast of Puerto Rico. Land use in the surrounding area is industrial, agricultural, and rural residential. The site is in a sparsely populated rural region and lies above the island's largest aquifer, which serves as a source of drinking water for over 12,000 area residents. In addition, the aquifer discharges to a wetland area to the north, which supports a large aquatic and bird population. The site lies in a limestone region characterized by karst terrain developed by dissolution of the existing limestone formations, and typified by closed depressions, sinkholes, and subsurface conduits. Between August and September 1982, UMC dispatched approximately 15,300 gallons of a manufacturing by-product waste mixture estimated to be comprised of 65 percent carbon tetrachloride and 35 percent acetonitrile to a leaking underground storage tank (UST), resulting in the release of all of the waste into the ground. Investigation by UMC determined that carbon tetrachloride contamination had migrated offsite approximately 2 miles to the north and occupied an area of about 2.1 mi^2. Consequently, five local water supply wells were closed in 1982 due to the potential for carbon tetrachloride contamination, and UMC provided a permanent alternate water supply to users. In 1983, UMC began implementing remedial actions to remove carbon tetrachloride from the soil and ground water: this included the installation and operation of a vacuum extraction system until March 1988; ground water pumpage from the AH Robins well adjacent to and north of the site until 1985; installation and operation of a second ground water contaminant recovery extraction well, UE-1, on the UMC facility in 1984, with air stripping and residual discharge to a sinkhole; and placement of a concrete cap over the tank farm. In 1987, because of residual ground water contamination that has remained both on and offsite, EPA ordered UMC to continue its remedial activities including resuming operation of the vacuum extraction system, pumping extraction well UE-1, and ground water monitoring, as well as determining the feasibility of restoring all or portions of the aquifer to health-based levels. This ROD addresses the residual ground water contamination resulting from the 1982 UST leak at the UMC facility. The possibility of residual contamination in the soil as a continuing source of carbon tetrachloride contamination in the ground water will be addressed by the EPA RCRA program and will not be a part of this remedial action. The primary contaminant of concern affecting the ground water is carbon tetrachloride.

The selected remedial action for this site includes: ground water pump and treatment from the UE-1 and AH Robins wells using air-stripping, followed by discharge of the treated water to an existing sinkhole; ground water pump and treatment using air stripping from the public supply well followed by distribution to the public water supply system; installation and operation of two to four additional offsite extraction wells with air stripping and recharge to the ground water; installation of chloride

UPJOHN MANUFACTURING COMPANY, PR
First Remedial Action - Final
(Continued)

monitoring wells near the coastline to monitor potential salt-water encroachment; and long-term ground water monitoring. Because it is not known whether contaminant levels in the aquifer can be reduced to the MCL, EPA will re-evaluate this remedy within five years of operation to determine the allowable contaminant levels that must be met before the extraction wells are shut down. If a decision is made that any portion of the aquifer will not be restored, a waiver from the MCL for reasons of technical impracticability will be evaluated at that time. The estimated capital cost for this interim remedial action is $2,200,000-$6,200,000 with annual O&M of $400,000-$700,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels will meet the MCL for carbon tetrachloride of 5 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Carcinogenic Compounds; Clean Air Act; Consent Decree; Containment; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; MCLs; Offsite Discharge; Offsite Treatment; Onsite Treatment; Organics; Public Exposure; Safe Drinking Water Act; State Criteria; Treatment Technology; VOCs.

YORK OIL, NY
First Remedial Action
February 9, 1988

ROD ABSTRACT

The York Oil Company site, encompassing 17 acres, is located in the Hamlet of Moira, Franklin County, New York. Wetlands and woodlands are the principal land use in the vicinity of the site. Residences exist along the main roads interspersed with active/inactive agricultural and pasture land. The now dissolved York Oil Company operated a waste oil recycling facility from approximately 1964 to 1977. Crankcase industrial oils, with some containing PCBs, were collected from sources throughout New England and New York, then stored and/or processed at the site in eight above-ground storage tanks, a series of three earthen-damned settling lagoons, and at least one below-ground storage tank. The recycled PCB-contaminated oil was either sold as No. 2 fuel oil or used in dust control for the unpaved roads in the vicinity of the site. During heavy rains and spring thaws, the oil-water emulsion from the lagoons would often overflow onto the surrounding lands. In 1964, in lieu of paying damages to adjacent farm-owners, the oil company purchased land in the area of the spills. The York Oil site contamination was first discovered in 1979 by a New York State Department of Transportation road crew, who then notified the New York State Department of Environmental Conservation (NYSDEC). Several interim actions have been undertaken at the site to contain the PCB-contamination problem. Currently, soils, sediments, ground water, and surface water are contaminated with PCBs, VOCs, metals, and phenols.

The selected remedial action for this site includes: excavation of approximately 22,000 yd^3 of contaminated soil and approximately 8,000 yd^3 of contaminated sediments with onsite solidification followed by onsite disposal of treatment residuals; installation of deep ground water drawdown wells and shallow dewatering wells to collect the sinking contaminant plume and the oil during excavation, with onsite treatment and subsequent discharge in accordance with New York State discharge requirements; offsite thermal treatment of approximately 25,000 gallons of contaminated tank oils in addition to other oils collected at the site; cleaning and demolition of the empty storage tanks; and grading. Treatability studies will be conducted during remedial design to determine the effectiveness of the solidification process in meeting specified treatment levels and to determine the optimal treatment system for ground water. The estimated capital cost for this remedial action is $6,500,000 with present worth O&M of $500,000.

PERFORMANCE STANDARDS OR GOALS: The cleanup level for PCBs in soil of 10 mg/kg was derived based on the current New York State goal to clean up uncontrolled PCB sites in residential areas to a level less than 10 mg/kg, and on the Toxic Substances Control Act PCB Spill Clean Policy which states that "PCB spills in residential areas ... [should] ... be remediated to 10 mg/kg." The clean level for total phenols in ground water is 100 ug/l in accordance with New York State Ambient Water Quality Guidelines.

YORK OIL, NY
First Remedial Action
(Continued)

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Arsenic; Benzene; Direct Contact; Excavation; Ground Water Treatment; Incineration; Lead; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Treatment; Organics; PCBs; Phenols; RCRA; Sediments; Soil; Solidification/Stabilization; State Criteria; Surface Water; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs.

ALADDIN PLATING, PA
First Remedial Action
September 27, 1988

ROD ABSTRACT

The two-acre Aladdin Plating site is a former electroplating facility located in Scott and Abington Townships, Lackawanna County, Pennsylvania, approximately 1.5 miles north of the Town of Chinchilla. The area surrounding the site is wooded, with 4 residences within 100 yards and about 120 people living within a 0.25 mile radius. Approximately 11,000 people within 3 miles of the site use domestic and public ground water wells for drinking water. Site runoff flows northwest toward Leggetts Creek, a principal tributary of Griffin Pond Reservoir. Leggetts Creek and Griffin Pond are sources of supplemental drinking water for more than 100,000 people. The nearest residential well is less than 1,500 feet from the site. Aladdin Plating conducted electroplating operations from 1947 to 1982. Hazardous materials used in operations include sulphuric acid, chromic acid, cyanide, chromium, and other heavy metals. For 35 years, electroplating waste effluents containing heavy metals and other contaminants were discharged via a ditch and underground pipes to a shallow surface lagoon near the electroplating building. A fire destroyed the facility and ended operations in 1982. Three source areas of contamination have been identified: the site of the former plating facility building, a buried trench (presumably the building's floor drain), and the lagoon. In 1983, chromium was detected in onsite soils. Subsequent testing by EPA in 1984 also identified lead and cyanide in onsite soils. In addition, ground water samples from onsite monitoring wells showed significant levels of arsenic, cadmium, chromium, and lead; all exceeded their respective MCLs. In March 1987, EPA performed emergency response activities to remove significant immediate health threats. These responses included fencing contaminated zones and removing drums and vats containing hazardous wastes. This response action addresses only the remediation of the contaminated soil onsite. The ground water contamination will be addressed in a subsequent remedial action. The primary contaminants of concern affecting the soil and ground water are arsenic, chromium, and lead.

The selected remedial action for this site includes: excavation and offsite stabilization of approximately 12,000 yd^3 of contaminated soil, with disposal of the treated soil in an offsite landfill and replacement of the excavated soil with clean fill. The estimated present worth cost for this remedial action is $4,461,000 with no associated O&M costs.

PERFORMANCE STANDARDS OR GOALS: Soils will be excavated to a depth where chromium contamination is 50 mg/kg or less.

KEYWORDS: Arsenic; Chromium; Direct Contact; Excavation; Filling; Ground Water; Ground Water Monitoring; Inorganics; Lead; MCLs; Metals; Offsite Disposal; Offsite Treatment; Public Exposure; RCRA; Safe Drinking Water Act; Soil; Solidification/Stabilization; State Criteria.

AMBLER ASBESTOS PILES, PA
First Remedial Action
September 30, 1988

ROD ABSTRACT

The Ambler Asbestos Piles site is located in the southwestern portion of the Borough of Ambler, Montgomery County, Pennsylvania. Land around the site is used for industrial, residential, commercial, and transportation purposes. The site is bordered on the west by Wissahickon Creek and its flood plain. A low density housing development lies to the southwest. The site consists of four distinct areas of asbestos contamination: the Locust Street Pile, the Plant Pile, the Pipe Plant Dump, and the asbestos settling basins/filter bed lagoons. The waste piles of concern in this operable unit are the Locust Street Pile and the Plant Pile. Within a 0.25 mile radius of the Locust Street Pile are approximately 40 residences and a public playground that was closed in 1984. The K&M Company owned and operated the site from the late 1800s to 1962, and produced asbestos products such as paper, millboard, electrical insulation, linings, conveyor belts, and high pressure peckings. The primary wastes generated and disposed of in the Locust Street and Plant Piles during that period were spent magnesium/calcium (from pharmaceutical operations) and asbestos process waste. In 1962, Certainteed Corporation purchased a portion of the site and facilities from K&M and manufactured asbestos-cement pipe at the plant. Nicolet Industries, Inc. purchased the remainder of the site and manufactured asbestos millboard and monolithic products. The Locust Street Pile continued to receive asbestos waste from Nicolet until sometime after 1964; however, waste continued to be deposited on the Plant Pile until 1980. EPA and the Pennsylvania Department of Environmental Resources conducted their first investigation of the site in 1971, noting visible emissions and substantial dust concentrations attributed to asbestos. Subsequent investigations of the surface water, bulk waste samples and air samples in 1983 revealed asbestos contamination. In September 1983, the Centers for Disease Control issued a Public Health Advisory recommending the closure of the nearby playground. In 1984, EPA implemented emergency response actions to establish a soil and vegetative cover, install a drainage system, and provide erosion control measures over the Locust Pile. In addition, Nicolet had covered the Plant Pile by June 1984. The primary contaminant of concern affecting the sediments, surface water, and debris is asbestos.

The selected remedial action for this site includes: installation of a geotextile and soil cover on the exposed areas of waste piles; erosion control/repair on waste pile slopes to facilitate vegetation; pump and treatment (using filters) of surface water from lagoon and settling basins with onsite discharge, backfilling and regrading lagoon and settling basins to promote positive drainage, and onsite disposal of collected sediments and asbestos on the waste piles; implementation of slope stability control measures, if deemed necessary after testing; installation of gabions or rip-rap to prevent scouring action of Wissahickon Creek on the waste piles;

runoff collection and treatment; preparation of a contingency plan; and access restructions. The estimated capital cost for this remedial action is $5,135,000, with estimated annual O&M costs of $46,000 to $63,000 for years 2 through 6 and $33,000 for years 6 through 30.

PERFORMANCE STANDARDS OR GOALS: Remedy addresses containment of asbestos-contaminated debris; therefore, no cleanup level is provided for the debris. Surface water treatment will meet State NPDES requirements. Individual cleanup goals not provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; ARARs; Asbestos; Backfilling; Capping; Containment; Debris; Direct Contact; Flood Plain; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Public Exposure; Public Health Advisory; RCRA; Sediments; State Criteria; State Permit; Surface Water; Treatment Technology.

AVTEX FIBERS, VA
First Remedial Action
September 30, 1988

ROD ABSTRACT

The 440-acre Avtex Fibers site is located in Warren County, Front Royal, Virginia. The facility is bounded to the west and northwest by the Shenandoah River and to the south, northwest, and east by residential areas. Approximately 1,300 people live within one mile of the site. The western part of the site lies within the limits of the Shenandoah River's 100-year floodplain. The Avtex Fibers site has produced rayon fibers since 1940, polyester between 1970 and 1977, and polypropylene since 1985. During this 48-year period, byproducts from the rayon manufacturing process were disposed of in onsite surface impoundments. These byproducts included sodium cellulose xanthate-based viscose and zinc-hydroxide sludge. Fly ash (from incinerator exhaust air pollution control devices) and boiler house solids were disposed of in five other surface impoundments. Land disposal of viscose waste ceased in 1983; since that time, the waste has been routed directly to an onsite wastewater treatment plant. In 1982, carbon disulfide, a constituent of viscose waste, was identified in ground water samples from residential wells located across the Shenandoah River from the site. In response to the results of a ground water investigation Avtex implemented interim measures, which included purchasing 23 subdivision properties on the west side of the river that had contaminated domestic wells, and initiating a ground water pump and treatment program. This ROD is the first of two operable units and addresses ground water remediation and interim remedial measures for the viscose basins responsible for ground water contamination. A subsequent remedial action will address source control and viscose basin remediation. The primary contaminants of concern affecting the ground water are phenols, and metals including arsenic and lead.

The selected remedial action for this site includes: ground water and basin liquid pump and treatment in the existing onsite activated sludge wastewater treatment plant, following completion of necessary upgrades, modifications, and construction of pretreatment units, with offsite discharge of treated water to the Shenandoah River; monitoring on- and offsite ground water, surface water, and basin fluids; and placing deed restrictions prohibiting the use of ground water on the affected properties. The estimated present worth cost for this remedial action is $9,122,000.

PERFORMANCE STANDARDS OR GOALS: Ground water will be treated to meet MCLs, EPA References Dose-based water limits, Federal AWQC and State Drinking Water Standards. Individual goals include phenols 0.3 mg/l (AWQC), lead 0.05 mg/l (MCL/VAGWS), and arsenic 0.05 mg/l (MCL/VAGWC). When the aquifer restoration goals are attained, the hazard index for ingestion of ground water will be less than 1 for the noncarcinogen contaminants in the ground water.

AVTEX FIBERS, VA
First Remedial Action
September 30, 1988
Continued

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prohibit the use of ground water on the affected properties.

KEYWORDS: ARARs; Arsenic; Clean Water Act; Deed Restrictions; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; Onsite Discharge; Onsite Treatment; Phenols; Safe Drinking Water Act; State Criteria; Surface Water; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands.

BENDIX, PA
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Bendix site is an aircraft instruments manufacturing plant located near the Village of South Montrose, Bridgewater Township, Susquehanna County, Pennsylvania. The 60-acre site is situated in a sparsely populated area (approximately 500 people) atop a topographic divide between the Meshoppen Creek and Wyalusing Creek watersheds. Natural ground water discharge areas exist east of the site in a wetlands area of Meshoppen Creek, and west of the site at the headwaters of Wyalusing Creek. South Montrose is solely dependent on private ground water wells for water. The Bendix Corporation (Bendix) acquired the parcels of land comprising the site in 1951 and 1952, and was acquired by Allied Corporation (Allied) in 1983, and finally merged into Allied in 1985; Allied is the current owner of the property. From 1952 to 1958 industrial solvent wastes were disposed of in a lagoon northeast of the plant, and for several years similar wastes also were disposed of in a series of onsite small trenches east of the plant. In addition, from the early 1950s until 1978, an earthen disposal pit installed by Bendix was used for the disposal of water-soluble cutting oil and oil-contaminated water from air compressors. The basin was drained of free liquids, backfilled, and seeded in late 1978. Investigations performed by Bendix from 1984 through 1987 indicated that as a result of past disposal practices, contamination from subsurface soil has been leaching into the underlying ground water. Five source areas of contamination have been identified at the site: a TCE storage tank area, the pet/trench area, an old landfill area, the area of a former solvent evaporation facility, and a former drum storage area behind the plant building. Bendix is currently supplying carbon filter units to users of affected wells. The primary contaminants of concern affecting the ground water and soil are VOCs including TCE.

The selected remedial action for this site includes: soil vacuum extraction and soil aeration; onsite ground water pump and treatment with air stripping; and treatment of offsite ground water contamination through carbon adsorption at the well heads. The estimated present worth cost for this remedial action is $4,487,000 with annual O&M costs of $542,000.

PERFORMANCE STANDARDS OR GOALS: Both on- and offsite ground water cleanup goals have been set at less than 1 ug/l TCE. Soil will be cleaned to 100 ug/kg leachable VOCs based on the ground water cleanup goal.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration, Air Stripping; ARARs; Clean Water Act; Direct Contact; Flood Plain; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Treatment; Onsite Treatment; Organics; RCRA; Safe Drinking Water Act; Soil; Sole-Source Aquifer; State Criteria; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria; Wetlands.

BERKS SAND PIT, PA
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The three to four-acre Berks Sand Pit site is located in Longswamp Township, Berks County, Pennsylvania. There are at least 20 single family homes within the investigation area, including one on top of the actual sand pit. The immediate vicinity of the site is zoned for low density residential use. The Berks Sand Pit was created by the removal of sand and gravel, but reportedly was used by area residents for refuse disposal. Industrial waste also was alleged to have been disposed of in the area around the pit. Houses were constructed and private wells installed at the location beginning in 1978, after the pit was backfilled. The site first came to the attention of EPA in January 1982 when area residents detected ground water contamination. Emergency actions were undertaken by EPA in the summer of 1983. The pit was partially excavated and backfilled with clean fill, but no pocket of contamination was discovered. The primary contaminants of concern affecting the ground water, surface water, and sediments are VOCs including 1,1,1-TCA, 1,1-DCA, PCE, and 1,1-DCE.

The selected remedial action for this site includes: excavation of contaminated sediments with offsite treatment by incineration; ground water pump and treatment using air stripping and vapor phase carbon absorption with reinjection of treated water back into the aquifer; provision of an alternate water supply system, surface and ground water monitoring; and restrictions to prevent installation of drinking water wells in the contaminated aquifer. The estimated present worth cost for this remedy is $10,773,100, with annual O&M costs of $459,200.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals will attain health-based MCLs for 1,1,1-TCA 200 ug/l and 1,1-DCE 7 ug/l. Secondary target levels, based on published Unit Cancer Risk, will be met for 1,1-DCE and PCE 1.0 ug/l. Reinjection of treated ground water into the aquifer will meet Underground Injection Control requirements.

KEYWORDS: Air Stripping; Alternate Water Supply; ARARs; Carcinogenic Compounds; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Institutional Controls; MCLs; O&M; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PCE; RCRA; Safe Drinking Water Act; Sediments; Solvents; State Criteria; Surface Water Monitoring; Treatment Technology; VOCs.

CHISMAN CREEK, VA
Second Operable Unit - Final
March 31, 1988

ROD ABSTRACT

The Chisman Creek site is located near Grafton in York County, Virginia. This ROD addresses operable unit two, which consists of three ponds (designated A, B, and C), the freshwater tributary, and the Chisman Creek estuary. The site is located within the watershed of Chisman Creek, a tributary of the Chesapeake Bay. Approximately 500 to 1,000 people live within one mile of the site. Between 1957 and 1974, fly ash from the Virginia Power Yorktown Power Generating Station was disposed of in four abandoned sand and gravel borrow pits located approximately two miles south of the generating station. The fly ash disposal areas, designated Areas A, B, C, and D, became known as the Chisman Creek Superfund site. Between 1971 and 1973, all fly ash in Area D was removed and deposited in Area C. Area D was reportedly filled with construction rubble generated during the construction of public utilities in the area at that time. After a domestic well showed discolored water in 1980, the Virginia State Water Control Board (SWCB) and Virginia State Board of Health sampled residential ground water in the vicinity of the fly ash areas to determine the types and concentrations of contaminants present. The Virginia Institute of Marine Science and SWCB conducted additional studies to determine the nature and extent of area contamination. The first operable unit ROD was signed in September 1986. The remedial action, begun in November 1987, includes: placing a soil cover on two areas and a clay cap on a third area; relocating a portion of the tributary; providing an alternate water supply for residential areas; and post-closure monitoring. At the request of EPA, the U.S. Fish and Wildlife Service conducted the second operable unit remedial investigation to evaluate the impact of contaminants at the site on fish and wildlife resources and their habitat. Chemical analysis of the physical environment and biota of the site for operable unit two focused on eight metals. These were arsenic, cadmium, copper, lead, nickel, selenium, vanadium, and zinc. The most ubiquitous and abundant metals were nickel and vanadium. Bioassays showed the surface water quality in Ponds B and C to be below ARAR levels, and sediment from the Chisman Creek estuary to have no adverse impacts from the contaminants. Fish from the freshwater ponds and oysters from Chisman Creek have not been impacted. Human health risks from consumption of fish and oysters, or accidental ingestion of surface water and sediments are all within EPA guidelines for acceptable risks. The primary contaminants of concern affecting surface water in Area A include nickel and vanadium.

The selected remedial action for this site includes: diversion of surface runoff from Area A (covered with soil in Operable Unit One) into Pond A, and water quality monitoring to evaluate the effectiveness of both operable units. The estimated present worth cost for this remedial action is $137,000.

PERFORMANCE STANDARDS OR GOALS: An ARAR for vanadium has not been promulgated. However, EPA has recently developed an unpublished Estimated Advisory Concentration for vanadium of 7.7 ug/l which will be met in freshwater systems. Remediation will attain the Clean Water Act level for nickel 13.4 mg/kg.

CHISMAN CREEK, VA
Second Operable Unit - Final
(Continued)

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Clean Water Act; Flood Plain; Inorganics; Metals; O&M; Surface Water; Surface Water Diversion; Wetlands.

DELAWARE SAND & GRAVEL, DE
First Remedial Action - Final
April 22, 1988

ROD ABSTRACT

The Delaware Sand & Gravel (DS&G) site is a 27-acre inactive industrial waste landfill located in New Castle County, Delaware. It is bordered by Army Creek to the west, Army Creek and wetlands to the north, residential and business facilities to the east, and an abandoned sand and gravel quarry to the south. Also to the west of the site directly across Army Creek is the Army Creek Landfill NPL site. Residences are located approximately 30 feet from the landfill and a residential development is located approximately 0.5 miles south and southwest of the site. Underlying the landfill is the Potomac Aquifer, which is accessed about 1.25 miles south of the site and used as a public water source. The DS&G site consists of four disposal areas, referred to as the Drum Disposal, Inert Disposal, Ridge, and Grantham South areas. Between 1968 and 1976 the site accepted household and construction wastes and approximately 7,000 drums containing liquids and sludges from perfume, plastics, paint, and petroleum refining processes. In 1971, investigations revealed ground water contamination emanating from the Army Creek and DS&G landfills. In 1976, the Delaware Department of Natural Resources and Environmental Control issued an enforcement action requiring DS&G to discontinue disposal activities. A ground water recovery system was installed to prevent contaminated water from reaching the nearby private wellfield, which continues to operate. Investigations were conducted to characterize the source and extent of contamination from both sites, and in 1984 EPA initiated an emergency removal action at the DS&G site to remove approximately 600 drums from the Drum Disposal area. An estimated 535,000 yd^3 of waste material are located onsite. Wastes identified in the Drum Disposal area include subsurface soil and debris contaminated with PCBs, organic liquids, and inorganic solids. The Drum Disposal area is believed to be the major source of organic ground water contamination. The Ridge area consists of contaminated surficial soil, and drums, storage tanks and debris scattered on the surface. The Inert Disposal area contains various domestic waste, cars, trucks and storage tanks scattered on the surface. The Grantham South area is believed to contain surficial inert waste as well as deposited chemical wastes. Two hot spots of organic contamination were identified in this area. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, toluene, and xylenes, other organics including PCBs, PAHs, and phenols, and metals including chromium and lead.

The selected remedial action for this site includes: excavation and onsite mobile incineration of approximately 36,000 tons of contaminated soil and wastes from the Drum Disposal and Ridge areas, with on- or offsite disposal of residual ash and grading and revegetation of excavated areas; removal and offsite disposal of all surface debris material from the Inert area, followed by capping; construction of a RCRA cap over the Grantham South area; ground water pump and treatment with discharge to Army Creek; and ground water monitoring. The estimated present worth cost for this remedial action is $24,944,000.

DELAWARE SAND & GRAVEL, DE
First Remedial Action - Final
April 22, 1988
(Continued)

PERFORMANCE STANDARDS OR GOALS: The ground water remedy will result in MCLs or 10^{-6} risk levels being met at the site boundary. Ground water treatment will attain the levels specified in the NPDES regulations before being discharged to Army Creek. Individual goals were not specified. Excavation in the Drum Disposal area will attain soil contaminant levels based on acceptable drinking water exposure, including toluene 6,000 mg/kg, xylene 4.8 mg/kg, and phenol 497 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Acids; ARARs; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Containment; Debris, Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Inorganics; Landfill Closure; Lead; MCLs; Metals; Offsite Disposal; O&M; Onsite Containment; Onsite Discharge; Onsite Treatment; PAHs; PCBs; Phenols; Plume Management; Public Exposure; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Soil; State Criteria; State Permit; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

DORNEY ROAD LANDFILL, PA
First Remedial Action
September 29, 1988

ROD ABSTRACT

The Dorney Road Landfill site is located in Lehigh County, Pennsylvania. The site is approximately 27 acres, bounded on the east by Dorney Road, and extends westward such that the southwest corner is in Longswamp Township, Berks County. Land use in the area is rural, residential and agricultural. The population within an 0.25 mile radius of the site is estimated to be approximately 20 people. Currently, 1 residence is located within 1,000 feet of the site and 3 residences are within 2,000 feet of the site. The water supply for these nearby homes is ground water from private wells. Beginning in 1952, an abandoned iron mine pit on the site was used as an open dump. From 1966 to 1978, an unpermitted landfill was operated in the same mine pit. In 1986, EPA conducted a removal action and regraded the landfill to prevent runoff and erosion of landfill material from migrating to neighboring property. In 1980 and 1982, EPA investigations revealed elevated levels of VOCs, metals and phenols in ground water and leachate samples. This remedial action will prevent dermal contact and incidental ingestion of landfill soil and solid waste. It will also minimize the continued leaching of precipitation and onsite ponded waters through the contaminated landfill. A subsequent remedial action will address the ground water under the site. The primary contaminants of concern affecting the soil, ground water and surface water are VOCs including benzene, toluene and xylenes, metals including arsenic and chromium, and other organics including phenol and PAHs.

The selected remedial action for this site includes: offsite disposal of approximately 700,000 gallons of onsite pond water; construction of a dike and diversion ditch system to control runon/runoff; regrading and installation of a multi-layer landfill cap and a gas collection system; ground water monitoring; and deed and access restrictions. The estimated present worth cost for this remedial action is $14,000,000 with estimated annual O&M costs of $42,000.

PERFORMANCE STANDARDS OR GOALS: The remedy will reduce the cancer risk to below the 10^{-6} level.

INSTITUTIONAL CONTROLS: A notice will be placed on the land deed within site boundaries.

KEYWORDS: Arsenic; Benzene; Capping; Chromium; Debris; Deed Restrictions; Direct Contact; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; Metals; O&M; Offsite Disposal; Onsite Containment; Organics; PAHs; Phenols; RCRA; RCRA Closure Requirements; Soil; State Criteria; Surface Water Diversion/Collection; VOCs.

DOUGLASSVILLE DISPOSAL, PA
Second Remedial Action
June 24, 1988

ROD ABSTRACT

The Douglassville Disposal site occupies approximately 50 acres of land in Union Township, Berks County, Pennsylvania. It is almost entirely within the 100-year floodplain of the Schuylkill River. In 1941, Berks Associates began recycling lubrication oil at the site; waste solvents were recycled in the 1950s and 1960s. Wastes generated from those recycling processes were stored in onsite lagoons from 1941 until 1972. In November 1970, heavy rains caused the lagoons to overflow and release 2,000,000 - 3,000,000 gallons of wastes down the Schuylkill River. Federal and State actions were initiated to dispose of the waste material remaining in the lagoons. Before this action could be carried out, heavy rains from a hurricane caused the river to overflow its banks and inundate the entire site area in June 1972. An estimated 6,000,0000 - 8,000,000 gallons of wastes were carried by floodwaters downstream for about 15 miles. During cleanup after the storm, the lagoons were drained and backfilled by EPA. Lubrication oil recycling operations continued at the site until 1979 when the operator determined operational correction, mandated by the Pennsylvania Department of Environmental Resources (PADER), were cost prohibitive. Operations then turned to the practice of refining waste oils for use as fuel in industrial boilers. Beginning in 1979, oily waste sludge from the new recycling process was landfarmed onsite. This practice was halted in 1981 when PADER mandated operational corrections to the landfarming practices. In late 1985, all oil recycling operations at the facility were completely discontinued. This operable unit addresses the 3-4 acre area in the southern most portion of the site and is hydraulically upgradient of the rest of the site. The area consists of a concrete building, process equipment, piping, and at least 57 process tanks. The tanks are constructed of wood, concrete, or steel and range in size from 3,000 gallons to 600,000 gallons. Approximately 200,000 gallons of PCB and lead contaminated oil and waste sludges remain in the tanks. The buildings, tanks, tank wastes, and processing equipment are impediments to any future soil and ground water remediation, and are a source of continuing contamination of these media. The primary contaminants of concern include: VOCs, PCBs, PAHs, and lead.

The selected remedial action for this site includes: removal of liquid and sludge tank waste with transportation to an offsite incineration facility; decontamination of tanks, piping, processing equipment, and building materials; offsite disposal of building rubble, selling of tanks and other metal materials as scrap; offsite disposal of concrete, asphalt, and other materials; and treatment of generated decontamination fluids, as appropriate. The estimated capital cost for this remedial action is $4,050,000. No O&M will be incurred.

DOUGLASSVILLE DISPOSAL, PA
Second Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: Tanks, piping, processing equipment, and building materials designated for salvage or reuse will be decontaminated to a level not to exceed 100 ug/100 cm^2 PCBs on the surface, as determined by wipe sampling. Concrete, asphalt, other materials containing PCBs, and any others which cannot be decontaminated to less than 50 mg/kg PCBs, will be disposed of at an offsite hazardous waste landfill. This operable unit remedy does not attempt to ensure compliance with all ARARs for the entire site, but will not be inconsistent with a final comprehensive remedy for the site.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Debris; Direct Contact; Interim Remedy; Oils; Organics; Lead; Metals; Offsite Disposal; Offsite Treatment; PAHs; PCBs; RCRA; Toxic Substances Control Act; Treatment Technology; VOCs.

DRAKE CHEMICAL, PA
Third Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The Drake Chemical Site is a 12.5-acre inactive chemical manufacturing facility located in Lock Haven, Clinton County, Pennsylvania. The area surrounding the site includes American Color and Chemical Company to the west, Hammermill Paper Company to the southwest, Bald Eagle Creek to the south, the west branch of the Susquehanna River to the north, and an apartment complex and a shopping center to the east. Bald Eagle Creek and the Susquehanna River are wetland areas and are used for recreation and fishing. Lock Haven residents do not use ground water for drinking purposes. The facility operated between 1951 and 1982 manufacturing chemical intermediates used in producing dyes, cosmetics, textiles, pharmaceuticals, and pesticides. The site includes two synthetic-lined wastewater treatment lagoons, an unlined leachate lagoon, and a dry unlined sludge lagoon. The water and sediments within the two lined impoundments are highly contaminated with site-related organic and inorganic contaminants. The site surface is covered with debris, chemical sludge, and contaminated soil. Approximately 252,000 yd^3 of soil, sludges and sediments are contaminated. The Drake Chemical Company was cited several times by State and Federal agencies for violating environmental and health and safety regulations. In 1982, EPA began an emergency removal action in which surface drums, surface sludges, and liquids contained in process and storage tanks were removed and disposed of, and the site was fenced. A ROD signed in 1982 addressed the leachate stream that ran offsite towards Bald Eagle Creek, and remediation was completed in 1987. A subsequent ROD signed in May 1986 required demolition of onsite contaminated buildings and tanks and disposal in an offsite landfill. This work currently is being undertaken. The focus of the remedial action addressed in this ROD is remediation of the contaminated soil, sludges, and ground water at the site. The primary contaminants of concern affecting the ground water, surface water, soil, and sediments are VOCs including benzene, toluene, TCE, and xylenes, other organics including fenac, phenols, and PAHs, and metals including lead, chromium, and arsenic.

The selected remedial action for this site includes: excavation of approximately 252,000 yd^3 of contaminated sludge, soil, and sediments, followed by treatment in an onsite mobile rotary kiln incinerator, backfilling (possibly using the incinerator ash as backfill material), and installation of a vegetative cover; design and construction of an onsite wastewater biological activated carbon treatment plant with pump and treatment of the surface water, ground water, storm water, and aqueous wastes from the leachate lagoon at the treatment plant, followed by discharge to a local stream or POTW; and ground water monitoring. The estimated present worth cost for this remedial action is $97,363,000 with an average annual O&M of $787,000.

DRAKE CHEMICAL, PA
Third Remedial Action - Final
September 29, 1988
(Continued)

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals will attain an overall risk level of 1×10^{-5} by treatment of the ground water to MCLs or MCLGs. Discharge level of treated water will meet local POTW and NPDES requirements. Individual contaminant goals were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; ARARs; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Excavation; Filling; Ground Watr; Ground Water Monitoring; Ground Water Treatment; Incineration; Inorganics; Lead; MCLs; MCLGs; Metals; Offsite Discharge; O&M Onsite Treatmentp Organics; PAHs; Phenols Publicly Owned Treatment Works (POTW) RCRA; Sediments; Sludge; Soil; State Criteria; Surface Water; TCE; Toluene; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Wtlands; Xylenes.

FIKE CHEMICAL, WV
First Remedial Action
September 29, 1988

ROD ABSTRACT

The Fike Chemical site is an approximately 11-acre site located in the Nitro Industrial Complex, Nitro, West Virginia, on the flood plain of the Kanawha River, which is 2,200 feet to the west. The population within a 10-mile radius of the site is estimated to be 25,000. The site consists of the Fike operations property and the Cooperative Sewage Treatment, Inc. (CST) property, which is a joint venture between Fike (now Artel Chemicals, Inc.) and Coastal Tank Lines, Inc. The Fike plant property was an active chemical manufacturing plant from 1968 to June 1988. During Fike's operation, over 60 different chemicals were produced, all by batch reaction on an as-needed basis. Other site activities leading to contamination include onsite disposal of hazardous wastes through drum burial and unlined surface lagoons, and tank storage of various chemical stock, products, and wastes. The CST property, which is adjacent to the Fike property to the northwest, consists of a series of basins, treatment tanks, and sludge drying beds, which are designed to treat plant surface runoff and process wastewater delivered from Fike Chemical via separate sewer systems. The treated water is discharged into the Kanawha River. The CST property has a long history of enforcement activity resulting from violations of their NPDES permit and various noncompliance issues under RCRA, leading to termination of interim status in November 1985. Approximately 300 bulk storage tanks are located onsite, containing acids, bases, flammables, and cyanides. A minimum of 2,000 surface drums are onsite in uncontrolled storage facilities. Approximately 8,000 laboratory containers of known and unknown contents are at the site. Wastes buried onsite include 1,000 drums and an undetermined number of additional laboratory containers. Approximately 100,000 pounds of metallic sodium is contained in 300 of the drums onsite. A pressurized tank of methyl mercaptan contains approximately 9,000 gallons. This remedial action will reduce the imminent hazards currently present onsite. Contaminated soil and ground water will be addressed in a subsequent remedial action. The primary contaminants of concern affecting the soil, ground water and surface water are organics including PCBs and methyl mercaptan, inorganics including cyanide, asbestos, and acids, and metals.

The selected remedial action for this site includes: removal and offsite treatment through incineration and offsite disposal of the tank containing methyl mercaptan; offsite treatment and disposal of drums of metallic sodium; removal, bulking and offsite treatment and disposal of drums on the ground surface and of the materials found in various tanks, lines, and vessels (through incineration, offsite ion exchange or chemical oxidation, and stabilization or fixation depending on drum/tank contents); lab-packing and offsite disposal of laboratory containers or treatment through offsite incineration; drainage and stabilization of lagoons and treatment of the drained liquids with discharge of treated liquids to Kanawha River; excavation, bulking, storage and offsite disposal of buried drums;

FIKE CHEMICAL, WV
First Remedial Action
(Continued)

stabilization and/or removal and disposal of asbestos-containing insulation materials found in process lines; and removal and disposal of cyanides. The estimated present worth cost for this remedial action is $8,000,000 with no associated O&M costs.

PERFORMANCE STANDARDS OR GOALS: This remedial action is designed to reduce or eliminate the most threatening hazards to human health and the environment. The ROD individual goals were not specified. Lagoon liquids will be treated and disposed of in accordance with the NPDES permit issued by the State.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Acids; Air Monitoring; ARARs; Asbestos; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Flood Plain; Incineration; Inorganics; Interim Remedy; Metals; Offsite Disposal; Offsite Treatment; Organics; PCBs; Public Exposure; RCRA; Sludge; Solidification/Stabilization; State Permit; Surface Water; Temporary Storage; Treatment Technology.

HENDERSON ROAD, PA
First Remedial Action
March 30, 1988

ROD ABSTRACT

The Henderson Road site is an active waste facility situated on 7.6 acres of land in Upper Merion Township, Pennsylvania. The land in the vicinity of the site is zoned for light industrial, heavy industrial and residential use. The site is approximately 2,000 feet south and upgradient of the Upper Merion Reservoir (UMR), where ground water is part of a public water supply serving 228,000 customers. A water supply well 350 feet southeast and upgradient of the site serves 15 employees of a lumber company. The site area is also characterized by sinkholes resulting from dissolution and subsequent collapse of the dolomite and limestone bedrock. The O'Hara Sanitation Company (OSL) presently occupies the site with several automobile repair shops and a drilling contractor. The OSL presently conducts onsite waste storage and waste recycling operations. An anonymous phone call to the Pennsylvania Department of Environmental Resources (PADER) in 1977 stated that ABM Disposal Service Company transported and then injected industrial waste into a well located inside the OSL maintenance garage. Limited information is available on the types or volumes of materials disposed of before PADER was notified of injection activities at the site. Results of PADER and EPA sampling conducted between 1977 and 1981, and ground water monitoring conducted in 1986 revealed the presence of organic and VOC contamination both on and offsite. Of the 35 chemicals of concern identified at the site, fifteen were found in UMR in 1986. Certain site-related chemicals also have been detected between the site, UMR, and the adjacent water supply well. Additionally, the site is located in an area of regional ground water contamination. Studies also indicate that the central plume of contamination from the site has not yet reached the UMR, based on an estimated travel time for ground water from the site to reach UMR. However, onsite ground water is still highly contaminated and the extent of contamination in the rocks and fractures in the unsaturated bedrock has not been fully characterized. A potential might exist for increased offsite loading to the ground water. The primary contaminants of concern include VOCs and organics.

The selected remedial action for this site includes: installation of onsite and downgradient (if necessary) ground water recovery wells and treatment using air stripping with probable discharge to an adjacent stream, and possible discharge of a portion of the treated ground water onto an area near the injection well as part of the unsaturated zone treatment (soil flushing); closure of the injection well; excavation of contaminated oil pit sediments and removal of significant waste, if feasible, directly out of the injection well; installation, operation and maintenance of a carbon adsorption water treatment system at an affected offsite active well; deed restrictions affecting ground water usage; ground water monitoring; collection and evaluation of data during RD/RA phase for possible pilot testing of in-situ volatilization (ISV) of VOCs or another appropriate treatment technology in the unsaturated zone; and periodic reevaluation of cleanup goals. The estimated present worth cost for this remedial action ranges from $5,500,000 (without ISV, unsaturated zone treatment or downgradient pump and treatment) and $12,200,000 (with ISV).

HENDERSON ROAD, PA
First Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup will attain a 7×10^{-4} cancer risk level. Complete aquifer restoration is not considered feasible because of background contamination. Should background contamination increase or decrease, the risk level will also change. Individual cleanup goals were provided for 46 chemicals. Some goals include: PCE 6.9 ug/l (derived from EPA Superfund Public Health Evaluation Manual), TCE 25.8 ug/l (ACL based on background levels), toluene 2,000 ug/l (MCLG), benzene 5.52 ug/l (ACL based on background levels), chromium 50.0 ug/l (MCL), and lead 20.0 ug/l (MCLG).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to limit or prohibit ground water usage on properties affected by the injection well.

KEYWORDS: ACL; Air Stripping; ARAR; Arsenic; Benzene; Carcinogenic Compounds; Clean Water Act; Deed Restrictions; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Onsite Discharge; Onsite Treatment; Organics; PCE; Public Exposure; RCRA; Safe Drinking Water Act; Sediments; State Guidance; TCE; Toluene; Treatability Studies; VOCs; Water Quality Criteria.

KIMBERTON, PA
First Remedial Action
September 30, 1988

ROD ABSTRACT

The Kimberton site is located in the northeastern portion of Chester County, Pennsylvania, near the Philadelphia metropolitan area. The site encompasses the Monsey Products Company property and adjacent properties within the surrounding Village of Kimberton. Several buried lagoons are located on the site. The lagoons are in close proximity to numerous private water supply wells and less than one mile from French Creek, which is used for public recreation and fishing. The site had two successive owners before Monsey Products purchased it in 1968. All owners were involved in industrial production. One owner, Ciba Products Company, a predecessor of CIBA-GEIGY, operated eight lagoons at the site during its period of ownership from 1947 to 1959. The lagoons received various residues from the manufacturing operations at the time. In August 1981, VOCs were first detected during routine water quality testing of a private well on Monsey property. EPA's subsequent investigation in early 1982 indicated that soil, ground water, and surface water were contaminated by VOCs, including DCE, TCE and vinyl chloride. The lagoons were identified as a source of contamination, and subsequently, approximately 2,050 yd^3 of contaminated soil from three former lagoon areas were excavated and disposed of offsite in September 1984 as part of a site remedial action plan. The excavations were backfilled, regraded, and revegetated. Furthermore, in December 1986, CIBA-GEIGY and Monsey Products provided 25 residential and commerical locations with an alternate source of drinking and contact water. Currently, sampling and analysis has or currently is being performed in other lagoon areas to evaluate their potential as sources of ground water contamination. This remedial action was designed to address the health risk to those residents who may continue to use contaminated private wells. A subsequent ROD will address other sources of contamination as well as additional ground water remediation. The primary contaminants of concern affecting the ground water are VOCs including DCE, TCE and vinyl chloride.

The selected remedial action for this site includes: continued provision of an alternate water supply -- either by treating impacted residential and commerical wells by filtration using granular activated carbon adsorption or by providing below-grade storage tanks for all water needs (contact and drinking use); and continued monitoring of impacted wells. The estimated present worth cost for this remedial action is \$3,850,000 with estimated annual O&M costs of \$250,000 to \$300,000.

PERFORMANCE STANDARDS OR GOALS: Ground water treatment will attain a 10^{-6} risk level for VOCs. The use of granular activated carbon filters in impacted offsite wells has reduced the contaminants of concern to non-detectable levels.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply, ARARs; Clean Water Act; Consent Decree; Direct Contact; Drinking Water Contaminants; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; MCLs; O&M; Onsite Treatment; Safe Drinking Water Act; State Criteria; TCE; Treatment Technology; VOCs.

L.A. CLARKE & SON, VA
First Remedial Action
March 31, 1988

ROD ABSTRACT

The 40-acre L.A. Clarke site is located in Spotsylvania County, Virginia. Wood preserving operations began at L.A. Clarke & Son, Inc. in June 1937 and have continued to date with only one inactive period, from April 1979 to June 1980. During the past 50 years, creosote contaminated soil and sediments resulted from facility operations spills, waste streams entering the drainage ditches, and onsite disposal. Historical aerial photography indicates that from at least 1953 through 1974 wastewater was disposed into two concrete-lined pits. An area located north of the process facility also received wastes. Overflow from the concrete pits was stored in an earthen pit. Excess water was discharged to drainage ditches and sprayed on the ground around the storage yard to control dust. Aerial photography identified four additional waste water pits which date back to 1937. These four pits were filled in by 1979. In 1975, L.A. Clarke & Son, Inc. was issued a National Pollution Discharge Elimination System (NPDES) permit for outfalls from two onsite drainage ditches. These permits are still in effect. Phenol is the only toxic contaminant regulated by the permit. In 1980, L.A. Clarke & Son, Inc. was classified under RCRA as a treater of hazardous waste due to the presence of a wastewater impoundment lagoon. As part of a State-mandated remedial action in 1982, approximately 1,400 yd^3 of soil was excavated from the processing area to create a RCRA-regulated soil waste pile. The primary contaminants of concern affecting both the soil and sediments (total volume of 119,00 yd^3) are constituents of creosote including PNAs and benzene.

The selected remedial action for this site includes: in-situ soil flushing of subsurface soil underlying the process buildings followed by in-situ biodegradation in the creosote layer area; biological degradation of bottom sediments in the lagoon; onsite landfarming of excavated surface soil, sediments, and subsurface wetland soil; excavation, dredging, and onsite consolidation of contaminated sediments, subsurface wetland soil, buried pit materials, and surface soil not remediated via in-situ flushing; erosion/sedimentation control; backfilling excavated areas with treated soil and sediment; and ground water monitoring. The estimated capital cost for this remedial action is $21,080,000 with present worth O&M of $33,900. Should it be determined that the onsite process building requires removal, landfarming/biodegradation may be implemented at an added capital cost of $910,900.

PERFORMANCE STANDARDS OR GOALS: To achieve protection of the shallow aquifer for drinking water purposes, target cleanup levels for subsurface soil include PNAs 10.3 mg/kg and benzene 94.03 mg/kg. These levels correspond to a 10^{-6} site risk level and a 10^{-5} risk at the site boundary. These levels also will protect aquatic life in surface water.

L.A. CLARKE & SON, VA
First Remedial Action
(Continued)

INSTITUTIONAL CONTROLS: Insititutional controls necessary to maintain the site will be developed after completion of the remedial action.

KEYWORDS: ARARs; Benzene; Biodegradation; Clean Water Act; Direct Contact; Dredging; Excavation; Flood Plain; Ground Water Monitoring; Institutional Controls; Land Treatment; O&M; Onsite Treatment; Organics; RCRA; Sediments; Soil; Soil Washing/Flushing; State Criteria; Treatability Studies; Treatment Technology; Wetlands; VOCs.

MIDDLETOWN AIR FIELD, PA
First Operable Unit
December 31, 1987

ROD ABSTRACT

The Middletown Air Field site covers what is now the Harrisburg International Airport (HIA), located between the town of Middletown and Nighspire, Dauphin County, Pennsylvania. The airport is owned and operated by the Commonwealth of Pennsylvania Department of Transportation. The area surrounding the base is characterized as mixed residential/industrial. Between 1898 and 1962, the property was owned by the U.S. Government and used by the military. HIA and several other entities occupy what was referred to as the Olmsted Air Force Base. In March 1983, TCA contamination caused six of the ten onsite production wells supplying HIA to be taken out of service. Studies initiated under the Department of Defense Installation Restoration Program indicate that while ground water contamination due to volatile organic compounds exists, the exact source(s) of contamination cannot be clearly defined. Ground water contamination may result from one or more, possibly current, sources in the "industrial area". To date, HIA has been able to temporarily meet the water requirements of the facility by taking the most contaminated well off-line as a potable water source, and by blending potable water from a number of wells. The most prevalent contaminants of concern affecting the ground water are VOCs including TCE and PCE.

The selected remedial action for this site includes: provision of a potable water supply; construction of a central treatment plant; ground water pump and treatment using air stripping; and ground water monitoring. The estimated capital cost for this remedial action is $3,750,000 with annual O&M of $160,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels will meet a cumulative 10^{-6} cancer risk level for PCE 1.0 ug/l, and MCLs for TCE 5.0 ug/l and benzene 5.0 ug/l. An MCLG was established for toluene 2,000 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; ARARs; Carcinogenic Compounds; Drinking Water Contaminants; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; MCLs; MCLGs; O&M; Onsite Treatment; PCE; Safe Drinking Water Act; TCE; VOCs.

NEW CASTLE STEEL, DE
First Remedial Action - Final
March 31, 1988

ROD ABSTRACT

The New Castle Steel site (NCS) is a 3-acre disposal dump, located in New Castle, Delaware. The site is divided into two parts by a city drainage channel. One portion of the site, the inactive disposal area, occupies 1.3 acres, and the active area occupies 1.7 acres. Since operations began in 1907, solid waste generated by the Deemer Steel Company (DSC), located immediately across the NCS site, was piled and periodically spread over the surface of the disposal areas. The waste consisted primarily of black sand which may contain small quantities of bentonite and corn flour. Approximately, 1,800 yd^3 or 2,430 tons of black sand were generated each year. Other waste materials were sent to the disposal areas and mixed with black sand. These materials included: slag, coke, iron oxide, fine sand dust, and metal scrap. Between 1973 and 1980, electric furnace dust was generated at the rate of 9.6 tons per year. This dust was mixed with black sand and spread over the active waste area. The adoption of the Delaware Regulations governing hazardous waste in November 1980 identified the electric furnace dust and any mixture of this material with solid waste as a RCRA listed hazardous waste (waste number K061). EPA subsequently changed the definition of K061, and none of the waste from DSC operations would qualify as a listed hazardous waste. In December 1980, the electric furnace dust was found to be EP-toxic for cadmium, chromium, and lead. A June 1984 hydrogeological study reported the thickness of wastes in the fill section ranged from 8 to 13 feet, and the average thickness was approximately 10 feet. Wastes were placed over predominantly unconsolidated marsh sediments, which are underlain by approximately 50 feet of low-permeability clays. The uppermost Potomac aquifer, an important drinking water source, lies about 70 feet below the site, and is protected by the low-permeability clays. An Endangerment Assessment (EA) was prepared based on the data collected from the samples in January 1987. The EPA concluded that no significant risk to human health and the environment could be attributed to the site. Contaminant screening identified five indicator chemicals. They include: arsenic, cadmium, chromium, lead, and nickel.

The selected remedial action for this site is no further action. EPA will monitor surface wastes for lead until the site is deleted from the National Priorities List (NPL) and closed under the State closure law. There is no capital cost or O&M associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Concentrations in ground water of lead, cadmium, and chromium are below the levels established as MCLs under the Safe Drinking Water Act. Lead detected in surface water has exceeded Ambient Water Quality Criteria and may be adversely impacting a localized wetlands area. There is no evidence to link the levels of lead in the wetlands to the site. The higher levels can be partially attributed to the urban environment and tidal influx from the river.

INSTITUTIONAL CONTROLS: Not applicable.

NEW CASTLE STEEL, DE
First Remedial Action - Final
(Continued)

KEYWORDS: Arsenic; Chromium; Clean Water Act; Direct Contract; Drinking Water Standards; Inorganics; Lead, MCLs; Metals; No Action Remedy; RCRA; Safe Drinking Water Act; Sediments; State Criteria; Surface Water Monitoring; Water Quality Criteria.

ORDNANCE WORKS DISPOSAL, WV
First Remedial Action
March 31, 1988

ROD ABSTRACT

The Ordnance Works Disposal site, also known as the Morgantown Ordnance Works, is located one mile south of Morgantown, West Virginia. The Monongahela River is adjacent to the site with a fairly steep cliff separating the river from portions of the site. Remediation for this first operable unit focuses on the waste disposal area which consists of an inactive landfill, two former lagoons and the surrounding impacted area, and a scraped area of bare soil. These areas are located within an industrial tract of over 800 acres of which 670 acres are owned by Morgantown Industrial Park Association, a group of private individuals who joined together to purchase the Ordnance Works property in 1982. Prior to this, the site was owned by numerous companies and used for a variety of chemical production operations. The landfill covers a surface area of approximately 1.6 acres. The landfill was reportedly used from 1942 until 1962, for the disposal of various solid chemical wastes. Waste materials identified included: construction debris, slag, ash, and catalyst pillets. Arsenic and carcinogenic PAHs (CPAHs) were detected in the soils at concentrations exceeding risk-based cleanup levels. The former lagoon and the surrounding area, located adjacent to the landfill, cover a surface area of 3 to 4 acres. This area is relatively flat with a cinder-like surface layer and sparse vegetation. Metal plating wastes were placed in the lagoon between 1970 and 1976. The lagoons were excavated in 1981, by the responsible party, and the contents were disposed of offsite. The metals present in the soil are currently below the recommended cleanup levels. CPAHs have been identified at levels exceeding cleanup standards in the area adjacent to the lagoons. An oily, stained cinder material was observed in areas where CPAHs were detected. The scraped area, carving a surface area of approximately 162 acres, was an active disposal area for solid wastes from 1942 until 1962. The waste materials identified include: construction debris, oil-like stained soils, and catalyst pillets. Currently, arsenic and CPAHs exceed the proposed cleanup levels. The primary contaminants of concern affecting the soil and sediments include arsenic and CPAHs.

The selected remedial action for this site includes: consolidation of existing landfill waste and application of a multi-layer RCRA cap; excavation and onsite incineration of former lagoons and surrounding area, scraped area soil, and impacted stream sediments with onsite disposal of treatment residuals in the landfill prior to the installation of the cap (assuming the ash is not EP toxic); placement of clean fill in the excavated area, followed by grading and revegetation; implementation of surface management techniques for drainage and sediment control in the landfill area; ambient air monitoring; and post-treatment monitoring. The estimated present worth cost for this remedial action is $6,718,000.

PERFORMANCE STANDARDS OR GOALS: Risk-based cleanup levels for indicator chemicals were developed for arsenic 20 mg/kg, CPAHs 26 mg/kg and mercury 175 mg/kg. A PCB cleanup level of 5 mg/kg was used based on EPA cleanup goals for industrial sites.

ORDNANCE WORKS DISPOSAL, WV
First Remedial Action
(Continued)

INSTITUTIONAL CONTROLS: Land use restrictions that prohibit intrusive activities in capped areas would apply to future site use.

KEYWORDS: Air Monitoring; ARARs; Arsenic; Capping; Carcinogenic Compounds; Direct Contact; Excavation; Incineration; O&M; Onsite Contaminant; Onsite Treatment; PAHs; PCBs; Public Exposure; RCRA Clean Closure; Sediments; Soil; Treatability Studies; Treatment Technology.

PALMERTON ZINC, PA
Second Remedial Action
June 29, 1988

ROD ABSTRACT

The Palmerton Zinc site is composed of two locations in the Borough of Palmerton, Carbon County, Pennsylvania. Smelting operations have been conducted at two locations, a west smelter and an east smelter, flanking the Town of Palmerton, which is located at the confluence of the Lehigh River and Aquashicola Creek. Approximately 7,000 residents live in Palmerton, many of whom work at the smelting facility. Land use in the area is industrial, residential, and agricultural. The drainage pattern in the site area is toward Aquashicola Creek, designated a warm water fishery by the State of Pennsylvania, which flows into Lehigh River. Smelting operations were conducted in the west plant from 1898 to 1987, and in the east plant from 1911 to present. The site has had three owners, including the current operator, Zinc Corporation of America, and historically has produced zinc and other metals for a variety of products. Primary smelting of concentrated zinc sulfide ores, conducted until December 1980, resulted in the emission of large quantities of zinc, lead, cadmium, and sulfer dioxide. This air pollution caused defoliation of over 2,000 acres of vegetation in the vicinity of the east smelter. Between 1898 and 1987 process residue and other plant wastes (as well as municipal waste until 1970) were disposed of on Cinder Bank, a 2.5-mile, 2,000-acre waste pile located behind the east plant at the base of the Blue Mountains. Cinder Bank contains approximately 27.5 million tons of leachable metals including lead, zinc, and cadmium, as well as carbonaceous material. Large blocks of residue crack and break off, allowing rapid infiltration of runoff during periods of rain and snow melt, resulting in contaminated leachate percolating down to the ground water and seeping out of Cinder Bank. This remedial action addresses Cinder Bank. Additional areas of contamination as well as ground water and surface water contamination will be addressed in subsequent remedial actions. The primary contaminants of concern affecting the sediments, ground water, and surface water are metals including cadmium, lead and zinc.

The selected remedial action for this site includes: slope modification, capping, and application of a vegetative cover on Cinder Bank; construction of surface water diversion channels; surface water and leachate collection and treatment using lime-activated filtration lagoons and/or constructed wetlands; implementation of an inspection, monitoring, and maintenance plan; and wetlands restoration measures, if necessary. The estimated present worth cost for this remedial action will be in excess of $2,861,800; however, the exact figure will not be known until agreement is reached on the extent of remediation during remedial design.

PERFORMANCE STANDARDS OR GOALS: Surface water and leachate treatment levels will meet Clean Water Act requirements, and attain surface water background levels. Individual cleanup goals were not specified.

PALMERTON ZINC, PA
Second Remedial Action
June 29, 1988

ROD ABSTRACT

The Palmerton Zinc site is composed of two locations in the Borough of Palmerton, Carbon County, Pennsylvania. Smelting operations have been conducted at two locations, a west smelter and an east smelter, flanking the Town of Palmerton, which is located at the confluence of the Lehigh River and Aquashicola Creek. Approximately 7,000 residents live in Palmerton, many of whom work at the smelting facility. Land use in the area is industrial, residential, and agricultural. The drainage pattern in the site area is toward Aquashicola Creek, designated a warm water fishery by the State of Pennsylvania, which flows into Lehigh River. Smelting operations were conducted in the west plant from 1898 to 1987, and in the east plant from 1911 to present. The site has had three owners, including the current operator, Zinc Corporation of America, and historically has produced zinc and other metals for a variety of products. Primary smelting of concentrated zinc sulfide ores, conducted until December 1980, resulted in the emission of large quantities of zinc, lead, cadmium, and sulfer dioxide. This air pollution caused defoliation of over 2,000 acres of vegetation in the vicinity of the east smelter. Between 1898 and 1987 process residue and other plant wastes (as well as municipal waste until 1970) were disposed of on Cinder Bank, a 2.5-mile, 2,000-acre waste pile located behind the east plant at the base of the Blue Mountains. Cinder Bank contains approximately 27.5 million tons of leachable metals including lead, zinc, and cadmium, as well as carbonaceous material. Large blocks of residue crack and break off, allowing rapid infiltration of runoff during periods of rain and snow melt, resulting in contaminated leachate percolating down to the ground water and seeping out of Cinder Bank. This remedial action addresses Cinder Bank. Additional areas of contamination as well as ground water and surface water contamination will be addressed in subsequent remedial actions. The primary contaminants of concern affecting the sediments, ground water, and surface water are metals including cadmium, lead and zinc.

The selected remedial action for this site includes: slope modification, capping, and application of a vegetative cover on Cinder Bank; construction of surface water diversion channels; surface water and leachate collection and treatment using lime-activated filtration lagoons and/or constructed wetlands; implementation of an inspection, monitoring, and maintenance plan; and wetlands restoration measures, if necessary. The estimated present worth cost for this remedial action will be in excess of $2,861,800; however, the exact figure will not be known until agreement is reached on the extent of remediation during remedial design.

PERFORMANCE STANDARDS OR GOALS: Surface water and leachate treatment levels will meet Clean Water Act requirements, and attain surface water background levels. Individual cleanup goals were not specified.

PALMERTON ZINC, PA
Second Remedial Action
June 29, 1988
Continued

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Background Levels; Capping; Clean Water Act; Containment; Direct Contact; Flood Plain; Ground Water Monitoring; Leachate Collection/Treatment; Lead; Metals; Onsite Containment; Onsite Treatment; RCRA; Sediments; State Criteria; Surface Water; Surface Water Diversion/Collection; Surface Water Monitoring; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands.

RHINEHART TIRE FIRE, VA
First Remedial Action
June 30, 1988

ROD ABSTRACT

The Rhinehart Tire Fire (RTF) site is located in a sparsely populated rural area in Western Frederick County, Virginia, approximately six miles east of the Town of Winchester. Between 1972 and 1983, the site owner, Mr. Rhinehart, conducted a tire disposal operation which consisted of transporting discarded tires from various locations and storing them on a wooded slope behind his home. By October 1983, an estimated five to seven million tires had accumulated, and on October 31, 1983, caught fire. A hot oil produced from melting and pyrolysis of the tires seeped from the pile of tires into Massey Run. An undetermined quantity of oil flowed into Hoque Creek, which is a tributary to the Potomac River system. EPA's Emergency Response Team (ERT) installed a catch basin to trap the oil; however, because the high rate of oil and water seepage threatened to exceed the catch basin storage capacity, a lined 50,000-gallon pond was constructed immediately downslope from the burn area. Approximately 800,000 gallons of oil product was collected, removed from the site, and recycled into fuel oils. Soon after the fire, diversion structures were built by the owner of the site under a consent order agreement with EPA. EPA, through the Army Corps of Engineers, conducted a Remedial Investigation (RI) to characterize and define the extent of possible contaminants. The RI indicated that the precipitation falling on the ash-contaminated area continues to mix with both the solid residue and the liquid seepage. This remedial action will address the control of contaminated migration off-site via surface water runoff. A subsequent remedial action will address source control at the site. The primary contaminants of concern affecting the ground water, soil, and surface water are metals including arsenic and lead.

The selected remedial action for this site includes: collection of surface water runoff with gravity settling; collection of shallow ground water oily seeps, oil-water separation, and transport of water to a POTW; construction of berms to increase freeboard on two existing on-site ponds; and implementation of soil erosion controls. The estimated present worth cost for this remedial action is $1,332,340 with O&M costs of $145,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedial action will minimize the amount of offsite contamination migration. Individual containment goals were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Arsenic; Clean Water Act; Containment; Ground Water; Inorganics; Lead; Metals; O&M; Offsite Treatment; Oils; Publicly Owned Treatment Works (POTW); RCRA; Soil; Surface Water; Surface Water Collection; Surface Water Diversion; Water Quality Criteria.

SOUTHERN MARYLAND WOOD, MD
First Remedial Action - FINAL
June 29, 1988

ROD ABSTRACT

The Southern Maryland Wood Treating (SMWT) site is located in Hollywood, St. Mary's County, Maryland. The site is situated within a wetland area in a drainage divide such that runoff from the site discharges into Brooks Run and McIntosh Run tributaries, which flow into the Potomac River. The area surrounding the site is predominantly used for agricultural and residential purposes. From 1965 to 1975, SMWT operated as a pressure treatment facility for wood preservation. Currently, part of the site is being used as a retail outlet for pretreated lumber and crab traps. The waste generated at the site included retort and cylinder sludges, process wastes, and material spillage. These wastes were in six onsite unlined lagoons. An onsite freshwater pond became contaminated during the facilities active and inactive periods with VOCs, polynuclear aromatics (PNAs), and base/neutral extractables due to contaminated ground water and surface runoff. Cleanup actions were initiated in 1982 following legal actions by the Maryland Department of Health and Mental Hygiene. Liquids removed from the six lagoons were spray irrigated onto the nearby woods. The six lagoons were excavated, backfilled, and graded, and the freshwater pond was partially excavated. The excavated sludges were mixed with composited sludge and topsoil, and spread in a level treatment area located on the property. The primary contaminants of concern affecting the onsite ground water, soil, surface water, sediments, and debris include: VOCs, PNA, and base/neutral acid extractables.

The selected remedial action for this site includes: excavation/dredging of soils, sediments, tank liquids, and cement, and treatment using onsite incineration with onsite disposal of non-hazardous residual ash, backfilling, regrading, and revegetating, where necessary; installation of a slurry wall; dewatering of the slurry wall area by a ground water and surface water pumping system, and treatment using activated carbon adsorption or hydrogen peroxide and irradiation with discharge to the onsite pond; installation of a geotextile silt fence, sedimentation basins, and/or diversion; and ground water, surface water, environmental, organic vapor, and dust monitoring.

PERFORMANCE STANDARDS OR GOALS: All media will attain the cleanup goal for carcinogenic PNAs (CPNAs) of 22 ppm based on the maximum lifetime cancer risk. These goals were established for onsite future residents. The ash residue is expected to meet Best Demonstrated Available Technology (BDAT).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Acids; ARARs; Benzene; Clean Water Act; Debris; Direct Contact; Dredging; Excavation; Granular Activated Carbon; Ground Water; Ground Water Treatment; Incineration; O&M; Onsite Disposal; Onsite Treatment; Organics; RCRA; RCRA Clean Closure; Sediments; Slurry Wall; Soil; Surface Water; Toluene; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands; VOCs.

TYSON'S DUMP, PA
Second Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Tyson's Dump site is located in Upper Merion Township, Montgomery County, Pennsylvania. The site is an abandoned septic and chemical waste disposal facility on a four-acre plot bordered on the east and west by unnamed tributaries of the Schuylkill River. During its period of operation from 1962 to 1970, several formerly unlined lagoons were used to dispose of various industrial, municipal and chemical wastes. Spills and overflows reportedly occurred, dispensing contaminants throughout the site. Surface water runoff and seeps contributed to offsite migration of wastes toward the Schuylkill River. In 1973 the State ordered the original onsite disposal facility closed. As part of the closure, the waste lagoons were emptied, backfilled, and vegetated, and the contents transported offsite. An EPA investigation of the site in 1983 resulted in further remedial measures including the construction of a leachate collection and treatment system, drainage controls, a cover over the site, and a fence around the lagoon area. A ROD for the On-Site Area was issued in December 1984. This ROD was amended in March 1988 and incorporated the use of vacuum extraction to remove contamination from soils and bedrock underlying the On-Site Area. Further investigations of the Off-Site Area of the site indicated a need for remedial action. Subsequently, the Off-Site Area was divided up into five operable units. This ROD addresses the deep aquifer operable unit only. Contamination is believed to be migrating towards and within the deep aquifer in the form of dense non-aqueous phase liquids. Investigations revealed that ambient site conditions for the other four operable units represented an acceptable level of risk, and so remediation was considered unnecessary. The primary contaminants of concern affecting the ground water are VOCs including 1,2,3-trichloropropane, total xylenes, and toluene; and other organics.

The selected remedial action for this site includes pumping and treatment of contaminated ground water from the bedrock aquifer using air stripping with vapor-phase carbon (VPC) for treatment of gaseous emissions and, if necessary, granular activated carbon (GAC) polishing of air stripped water with discharge of treated water to river; offsite incineration of organic-phase condensate produced from steam regeneration of vapor-phase carbon beds; and ground water monitoring. The estimated present worth cost for this remedial action is $6,170,000 with annual O&M costs of $424,300, or $6,910,000 and $509,900 respectively, if GAC polishing is implemented.

PERFORMANCE STANDARDS OR GOALS: The target cleanup goals for ground water were based on acceptable risk levels of 10^{-6} for carcinogens, as well as MCLs and WQC and include 1,2,3-trichloropropane 0.00035 mg/l , xylenes 0.12 mg/l, and toluene 2.0 mg/l.

INSTITUTIONAL CONTROLS: Not applicable.

TYSON'S DUMP, PA
Second Remedial Action - Final
(Continued)

KEYWORDS: Air Monitoring; Air Stripping; Granular Activated Carbon (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; MCLs; O&M; Offsite Discharge; Offsite Treatment; Onsite Treatment; Organics/VOCs; Safe Drinking Water Act; State Criteria; Toluene; Treatment Technology; Water Quality Criteria; Xylenes.

TYSON'S DUMP, PA
Amended Remedial Action
March 31, 1988

ROD ABSTRACT

Tyson's Dump, a 4-acre abandoned septic and chemical waste disposal site, is located in Upper Merion Township, Montgomery County, Pennsylvania. Several formerly unlined lagoons were used to store various industrial, municipal, and chemical wastes. Spills and overflows reportedly occurred during the period of operation, thus allowing for the dispersal of wastes throughout the site. Surface water runoff and seeps contributed to offsite migration of the wastes toward the Schuylkill River. The site is bordered on two sides by unnamed tributaries to the river. When the Pennsylvania Department of Environmental Resources (PADER) ordered two dumps closed in 1973, the owner of the land, General Devices Inc., removed some ponded water but did not arrange for the removal of contaminated soils. Immediate removal measures were initiated in January 1983, following an anonymous citizen complaint about conditions at the site. These measures included: construction of a leachate collection and treatment system; installation of drainage controls and a site cover; and fencing of the lagoon area. In December 1984, EPA issued an operable unit ROD for the onsite area. Remedial actions selected in the ROD include: excavation and offsite disposal of contaminated soils and sediments; and upgrading the existing air strips to treat leachate, shallow ground water, and surface run-on. EPA began the remedial design phase for this selected alternative in January 1985. In the fall of 1985, Ciba-Geigy Corporation (CGC) agreed to conduct a further investigation of the offsite area. In November 1986, CGC initiated an onsite pilot study using an innovative vacuum extraction technology process. In June and July 1987, four responsible parties, CGC, Smith-Kline Beckman, Wyeth Laboratories, and Essex Group submitted an alternative proposal to EPA for the first operable unit cleanup. This proposal incorporated the results of the vacuum extraction process for remediating lagoon soils. In September 1987, after close review of the technology, EPA decided to recommend a ROD change to include vacuum extraction. This new alternative was not available when the original Feasibility Study was conducted prior to the 1984 ROD. In addition, CGC's investigation discovered that most of the contamination from the lagoon areas had migrated into the bedrock and excavation would not remove all the contaminants from the area underlying the site. The primary contaminants of concern are VOCs. The four indicator compounds include benzene, trichloroethene, tetrachloroethene, and 1,2,3-trichloropropane.

The amended remedial action for this site includes: in-situ treatment of soils and bedrock using vacuum extraction; treatment of the vacuum-extracted water using the onsite leachate water treatment system; installation of a soil cover following treatment; and ground water monitoring. The estimated present worth cost for this remedial action is $10,200,000.

TYSON'S DUMP, PA
Amended Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: Vacuum extraction will cleanup a 20 to 40 foot radius. Cleanup levels were developed using health-based acceptable intake levels and hypothetical exposure scenarios. The scenario producing the most stringent cleanup requirements was selected as the cleanup goal. Individual cleanup goals were listed for 45 contaminants. Cleanup levels for indicator compounds include: benzene 50 ug/kg, trichloroethene 50 ug/kg, tetrachloroethene 50 ug/kg, and 1,2,3-trichloropropane 50 ug/kg.

INSTITUTIONAL CONTROLS: Not specified.

KEYWORDS: ARARs; Direct Contact; Interim Remedy; Ground Water Monitoring; Leachate Collection/Treatment; O&M; Onsite Treatment; PCE; RCRA Landfill Closure; ROD Addendum; Soil; State Criteria; TCE; Treatment Technology; Vacuum Extraction; VOCs.

VOORTMAN FARM, PA
First Remedial Action - Final
June 30, 1988

ROD ABSTRACT

The 43-acre Voortman Farm site is located in Upper Salucon Township, Lehigh County, Pennsylvania. The site consists of a sinkhole that contained empty battery casings disposed of in late 1979 and early 1980. Citizen complaints in 1980 prompted the prohibition of dumping and subsequent site investigation. In September 1986, the battery casings in the sinkhole caught on fire. Since the battery casings were burning underground, attempts to extinguish the fire remained unsuccessful. In October 1986, access was gained to the burning wastes, which were then excavated and extinguished. Additional wastes and residues were excavated from the sink hole and disposed of offsite. The collapse of the sinkhole walls has formed a natural cap. There does not appear to be any leaching from any residual metals, contaminated soils or battery casings present.

The selected remedial action for this site is a no further action with continued ground water monitoring for five years. The estimated present worth cost for this remedial action is $26,000 with annual O&M of $6,860.

PERFORMANCE STANDARDS OR GOALS: Currently, the ground water does not violate drinking water standards. No location-specific or action-specific ARARs are applicable to this alternative.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Chromium; Ground Water Monitoring; Inorganics; Lead; Metals; No Action Remedy; Safe Drinking Water Act.

WEST VIRGINIA ORDNANCE, WV
Second Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The West Virginia Ordnance (WVO) site covers approximately 8,323 acres in Mason County, West Virginia. It is located on the east bank of the Ohio River. Almost one third of the site is occupied by a 2,788-acre wildlife station containing more than 30 shallow ponds created to promote a wetland/terrestrial habitat for various wildlife species. Established in 1942, the WVO plant manufactured explosives, specifically TNT, from toluene. General Chemical Defense Corporation of New York operated the plant until 1945. Red and yellow water (liquid wastes) were produced during the TNT manufacturing process. Yellow water was discharged to the Mill Creek drainage system, which eventually drains into the Ohio River; red water was discharged directly to the Ohio River through a pipe located about one foot offshore. Retention ponds were constructed to regulate the discharge of red and yellow water to the river. TNT and associated by-products were burned onsite. In May 1981, ranger officials observed a seep of red water adjacent to a pond located on the wildlife station. Upon examination, ground water discharging to this pond was found to be contaminated by di- and trinitrotoluenes and phenol. Localized contamination of the shallow ground water and discharge to surface water have been documented in the vicinity of the TNT manufacturing area, the burning grounds, sediments of surface water receiving contamination, and former wastewater storage lagoons. Evidence also indicates that soils of the industrial area, process facilities, and industrial wastewater facilities are contaminated by TNT and associated by-products (nitroaromatics). Based on the hydrogeologic setting of WVO, there is potential for contamination to migrate via surface water and/or ground water pathways to deeper layers of an underlying potable aquifer or to the Ohio River. Contaminant migration is possible toward the City of Point Pleasant and Camp Conlay community potable water supplies. The primary contaminants of concern affecting the soil, sediments, and ground water are nitroaromatics and lead.

The selected remedial action for this site addresses three distinct areas of contamination. These remedies include: Area 1 - purchase of contaminated land and control of land use, placing a soil cover over the contaminated area, and incorporating the area into the existing wildlife preserve; ground water pump and treatment to nitroaromatics criteria with discharge to surface water; monitoring discharge from the ground water treatment system to ensure compliance with the stream standards; and periodically inspecting and maintaining the soil cover in a stable condition. Area 2 - relocating ponds 1 and 2, filling them with clean material and covering them with a soil and clay cap; ground water pump and treatment to nitroaromatics criteria with discharge to surface water; and monitoring effluent from the treatment system to ensure compliance with surface water criteria. Area 3 - installing a soil cover over the West Well Area and the seep area; ground water pump and treatment to nitroaromatics criteria with discharge to surface water; monitoring effluent from the

treatment system to ensure compliance with surface water criteria; and periodically inspecting and maintaining the soil cover in a stable condition. The estimated present worth for this remedial action is $3,365,000, with estimated O&M cost of $216,500.

PERFORMANCE STANDARDS OR GOALS: West Virginia ground water protection standards permit ACLs if these levels will not pose a substantial present or potential hazard to health or the environment. Ground water cleanup levels were based on available chemical-specific standards, or a 10^{-6} cancer risk. Concentration limits for treated ground water in Areas 1 and 2 include: TNT 50 ug/l, dinitrobenzene 14 ug/l, trinitrobenzene 200 ug/l, 2,4-DNT 0.11 ug/l, and 2,6-DNT 0.022 ug/l. The criteria for Area 3 ground water include: TNT 4.6 mg/l; dinitrobenzene 12 mg/l; trinitrobenzene 6.2 mg/l; 2,4-DNT 0.26 mg/l and 2,6-DNT 0.052 mg/l.

INSTITUTIONAL CONTROLS: The purchase of Area 1 and incorporating it as part of the wildlife preserve will prohibit development of the lands for residential or industrial use.

KEYWORDS: ACL; ARARs; Capping; Carcinogenic Compounds; Clean Water Act; Containment; Direct Contact; Flood Plain; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; Metals; Onsite Containment; Onsite Discharge; Onsite Treatment; O&M; Organics; Public Exposure; RCRA; RCRA Closure Requirements; Sediments; Soil; State Criteria; Wetlands.

WESTLINE, PA
Second Remedial Action
June 29, 1988

ROD ABSTRACT

The Westline site, located in the town of Westline, McKean County, Pennsylvania, is a 40-acre tract of land formerly used as a lumber processing facility. Between 1901 and 1952, the onsite chemical plant converted lumber into charcoal, methanol, and acetic acid. In 1952, the plant was closed due to equipment deterioration and declining profits. Waste tars containing high levels of polynuclear aromatic hydrocarbons (PAHs) and various phenolic compounds were left onsite. An Emergency Removal Action was implemented in 1983 to remove the largest tar deposit, and a Record of Decision was signed in July, 1986, to address the excavation and offsite incineration of remaining tar deposits and contaminated soil. This second operable unit addresses potential ground water contamination. In 1985 high levels of benzene were found in two onsite monitoring wells. Additional tests indicated the presence of toluene, trichloroethane, phenol, and other VOCs; however, benzene was the only contaminant that exceeded Federal Maximum Contaminant Levels (MCLs) of 5 ug/l, and is, therefore, the primary contaminant of concern.

The selected remedial action for the ground water operable unit at the Westline site is no further action. Since drinking water for the town of Westline is obtained from small streams upgradient of the site and all contaminants except benzene are below Federal MCLs, EPA has determined that no significant risk to public health and the environment exists. Ground water will be monitored to ensure effectiveness of natural attenuation, and institutional controls will be implemented to prevent construction of new drinking water wells in the contaminated area. There are no capital costs associated with the remedy, and O&M costs for monitoring were not specified.

PERFORMANCE STANDARDS OR GOALS: Natural attenuation can meet the MCL for benzene 5.0 ug/l within a 5 to 10 year period. The remedy meets the 8.93×10^{-5} increased cancer risk level. Additionally, Water Quality Criteria and standards have not been exceeded.

INSTITUTIONAL CONTROLS: Restrictions will be implemented to prevent drilling of drinking water wells onsite.

KEYWORDS: ARARs; Benzene; Ground Water; Ground Water Monitoring; Institutional Controls; No Action Remedy; VOCs.

WILDCAT LANDFILL, DE
First Remedial Action
June 29, 1988

ROD ABSTRACT

The Wildcat Landfill site is located 2.5 miles southeast of Dover in Kent County, Delaware. The 44-acre site is bordered to the north and east by the St. Jones River and its associated wetlands, and to the south and west by residential and commercial development. A pond, created by construction of the landfill, is located directly adjacent to the site along the northwestern edge. The pond is the subject of a second operable unit for the site. Portions of the site lie within the 100-year floodplain of the St. Jones River. The site was operated as a permitted sanitary landfill between 1962 and 1973, accepting both municipal and industrial wastes. Industrial wastes suspected to have been disposed of include latex waste and paint sludges. Throughout its 11 years of operation, the facility routinely violated operating and other permits issued by regulating agencies. EPA began investigating the site in 1982. Typical wastes encountered at the site included municipal refuse latex in strips and sheets; scattered crushed, empty, or intact drums; and manufactured plastic items. Much of the waste is located on low-lying wetland sediments; however, the area to the southwest was excavated and backfilled with wastes. Consequently, in that area of the landfill, wastes are in direct contact with the surficial sand aquifer. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, other organics including PCBs, and metals including arsenic and lead.

The selected remedial action for this site includes: grading, installation of a soil cover, and revegetation of onsite direct contact risk areas; removal and offsite disposal of drums containing wastes by landfilling (if not hazardous) or incineration (if hazardous); replacement of two domestic wells adjacent to the site; institutional controls including well and land use restrictions; and groundwater monitoring. The estimated present worth cost for this remedial action is $5,400,000.

PERFORMANCE STANDARDS OR GOALS: The performance goal of this remedial action is to eliminate the existing direct contact risks posed by the landfill through institutional controls and to control contaminant migration. Individual contaminant goals are not applicable.

INSTITUTIONAL CONTROLS: Well restrictions on installation of all drinking water wells onsite and in adjacent offsite areas. Land use restrictions on any commercial or residential building onsite.

KEYWORDS: ARARs; Arsenic; Benzene; Clean Water Act; Containment; Debris; Deed Restrictions; Direct Contact; Drinking Water Contaminants; Flood Plain; Ground Water; Ground Water Monitoring; Incineration; Institutional Controls; Lead; Metals; Offsite Disposal; Organics; PCBs; RCRA; State Criteria; Subsidence; VOCs; Wetlands.

AIRCO, KY
First Remedial Action - Final
June 24, 1988

ROD ABSTRACT

The Airco site is a 2.7-acre industrial waste landfill located outside the zoned area of Calvert City, Marshall County, Kentucky. The site is situated on the eastern edge of a heavily industrialized area. It is bordered on the west by the B.F. Goodrich (BFG) NPL site, on the east by undeveloped land and a slough, on the north by the Tennessee River and on the south by agricultural land and a State highway. (The Airco site and the BFG site were studied as one site for the RI/FS and their remediation will be combined since they are located adjacent to each other and share a somewhat common history of use.) Airco began disposing waste material from their Calvert City plant into the landfill in 1959. By 1971, 18,000 tons of caustics, acids, VOCs, zinc and mercuric acetate, and mercuric chloride reportedly were disposed at the site. The landfill was unregulated until 1968, when a Solid Waste Disposal Permit was applied for and granted by the Kentucky Department of Natural Resources and Environmental Protection. Airco's Calvert City plant was sold to Air Products and Chemicals, Inc. (APC) in 1971. APC also leased the landfill from Airco until 1980, during which time they disposed of approximately 14,000 tons of coal ash containing low level metal contaminants, as well as polyvinyl chloride solids, ferric hydroxide sludge, and construction waste at the site. The landfill was capped and closed in September 1981. The site was placed on the NPL in September 1984. The primary contaminants of concern affecting the soil, sediments and ground water are VOCs including benzene, toluene and 1,2-dichlorethane, and other organics including PAHs and PCBs.

The selected remedial action for this site includes: excavation and consolidation of approximately 5,000 yd^3 of contaminated soil and sediments within the dikes and around the landfills from both the Airco and BFG sites, with onsite disposal in the former burn pit area at the BFG site followed by construction of an organic vapor recovery system and a RCRA cap over the burn pit; reconstruction of the dikes surrounding landfills for flood prevention; upgrading of the landfill caps and installation of a leachate extraction system with onsite treatment of the leachate and offsite discharge to the local river; pump and treatment at the BFG plant site of ground water using air stripping and biological treatment or activated carbon adsorption, and discharge to the local river; possible treatment of ground water with an oil/water separator if ground water contains significant oil, and temporary onsite storage of oil with transport offsite to an oil recycling facility; access restrictions; and institutional controls to prevent residential development. The estimated present worth cost for this remedial action (including all costs related to the BFG site), is $6,090,000 with present worth O&M estimated to be $3,130,000.

AIRCO, KY
First Remedial Action - Final
Continued

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels will attain specific ACLs for the selected indicator chemicals at the site and include EDC (8.5 mg/l), benzene (8.5 mg/l), and TCE (8.5 mg/l). Contaminated subsurface soil in the burn pit areas will attain an EDC level of 139 mg/kg, which is based on the allowable EDC ground water concentration.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent residential development and installation of drinking water supply wells.

KEYWORDS: ACL; Air Monitoring; Air Stripping; ARARs; Benzene; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Containment; Direct Contact; Deed Restrictions; Excavation; Filling; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Leachate Collection/Treatment; MCLs; Offsite Discharge; Oils; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; RCRA Landfill Specifications; Sediments; Soil; State Permit; TCE; Temporary Storage; Toluene; Vacuum Extraction; VOCs; Water Quality Criteria.

ALPHA CHEMICAL, FL
First Remedial Action - Final
May 18, 1988

ROD ABSTRACT

The Alpha Chemical site, located in Kathleen, Florida, consists of over 32 acres, that comprise the Alpha Resins Corporation (ARC), a facility of the Alpha Chemical Corporation. Surface water from the site drains into a swampy, low-lying wetland area. Karst topography is evidenced by sinkholes in the area. The facility has produced unsaturated polyester resin for fiberglass manufacturers since 1967. A waste stream, referred to as the "water of reaction", is produced as a by-product of polyester resin formation. This waste stream is composed primarily of water containing small amounts of organics. ARC obtained a State permit in 1967 to place this waste stream in two unlined surface impoundments. The permit allowed for the ponds to act as percolation basins, allowing for the natural biodegradation of the organics. The percolation ponds have not been used since 1976. At that time, a thermal oxidizer was installed to incinerate the waste stream rather than place it in the percolation ponds. After switching to incineration, Pond 4 dried up. It was then used for one year as a solid waste landfill by ARC and its employees. In 1977, the landfill was covered with two feet of native soil. In 1982, ARC contacted the Florida Department of Environmental Regulations (DER) to obtain a permit to line Pond 3 with concrete for caustic wash water disposal. As a condition of the permit, DER required ARC to install ground water monitoring wells. In April, 1983, a DER ground water assessment report indicated industrial impacts on the surficial aquifer. Further soil and ground water sampling investigation did not reveal a definable plume of contamination. Of the 23 organic constituents identified in the ground water, ethylbenzene was found to be the most frequently detected, having a high concentration of contamination.

The selected remedial action for this site includes placing a low permeable cap over the unlined pond area, and long-term ground water and surface water monitoring. The estimated capital cost for this remedial action is $142,400 with present worth O&M of $186,200.

PERFORMANCE STANDARDS OR GOALS: Recommended AWQC are met for all wells at the property line and immediately downgradient of all site areas except the unlined pond. Capping will manage the threat of future releases from the pond area and meet AWQC downgradient of the unlined pond for: ethylbenzene 1.4 mg/l, and 1,2-dichloropropane 1.4 mg/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ACL; ARARs; Capping; Clean Water Act; Ground Water; Ground Water Monitoring; O&M; Organics; RCRA; State Criteria; Surface Water Monitoring.

BROWN WOOD PRESERVING, FL
First Remedial Action - Final
April 8, 1988

ROD ABSTRACT

The 55-acre Brown Wood Preserving site is located approximately two miles west of the City of Live Oak, Suwanee County, Florida. The site is located in karst terrain in which sinkholes are a common geological feature. The areas surrounding the site are considered rural and light agricultural. There are four private wells located along the site periphery that obtain water from an aquifer 20-100 feet below the site. The public water supply wells for the City of Live Oak are located less than two miles away. The site contains a former wood preserving plant facility, which pressure treated timber products with creosote and some pentachlorophenol (PCP) for thirty years between 1948 and 1978. During this time, several different companies operated the facility. In addition, the facility was rebuilt following a fire in February 1974. Sludge and contaminated soils have been identified in the immediate vicinity of the plant site and an upgradient lagoon. This three-acre lagoon drains approximately 74-acres and contains water provided above approximately 3,000 yd^3 of creosote sludge and contaminated soil. In addition, small amounts of solidified creosote and PCP are contained in onsite storage tanks and retorts. In 1981, EPA was notified by one of the former facility owners that hazardous waste may have been handled at the site. In July 1982, the Florida Department of Environmental Regulation (FDER) inspected the site and detected a number of organic compounds. A action, completed in February 1988, resulted in the removal of approximately 200,000 gallons of lagoon water and 15,000 tons of contaminated lagoon sludge and soil. The primary contaminants of concern affecting the soil, sediments, sludge, and waste water are creosote constituents including PAHs.

The selected remedial action for this site includes: removal and treatment, if necessary, of lagoon water with discharge to a POTW; excavation, treatment, and offsite disposal of approximately 1,500 tons of the most severely contaminated soil and sludge; onsite biodegradation of approximately 10,000 tons of the remaining soils in a 14-acre treatment area constructed with a liner and an internal drainage and spray irrigation system; covering of the treatment area with clean fill after bioremediation; and ground water monitoring. The estimated present worth cost for this remedial action is $2,740,000.

PERFORMANCE STANDARDS OR GOALS: The soils will be treated to reduce the concentration of total carcinogenic indicator chemicals to 100 mg/kg throughout the volume of material treated. This level for total carcinogenic indicator chemicals corresponds to an approximate 1×10^{-6} soil ingestion risk level.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Carcinogenic Compounds; Direct Contact; Excavation; Ground Water Monitoring; Land Treatment; O&M; Offsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Sediments; Sludge; Soil; Temporary Storage; Treatability Studies; Treatment Technology.

CELANESE FIBERS OPERATIONS, NC
First Remedial Action
March 23, 1988

ROD ABSTRACT

The 450-acre Celanese Fiber Operations (CFO) site is occupied by a polyester raw-material production facility, and is located in Cleveland County, one mile north of Earl, North Carolina. The plant facilities consist of the plant production area, wastewater treatment area, former waste disposal areas, land farm area, and recreation and tree farm areas south of the main plant. The plant began operations in 1960 as Fibers Industries, Inc. and manufactured polyester polymer chip and filament yarn using the chemicals dimethyl terephthalate and ethylene glycol. Celanese Corporation bought the facility in 1983. The CFO waste treatment plant was constructed in phases concurrent with the manufacturing plant. This resulted in the disposal of chemical wastes directly into a drainage ditch during the early years of operation prior to completion of the waste treatment plant. Treated effluent has been discharged to Buffalo Creek since the mid-1960s, when CFO completed construction of the treatment plant. In addition to the discharge from the wastewater treatment plant, CFO also discharges alum-treated bandcaster water directly to Buffalo Creek. Several areas around the plant have been used for waste disposal, including old burning pits for normal plant wastes (polyester and trash), a glycol recovery unit sludge burial area, and a former drum storage and staging area (drums contained solutions that failed to polymerize) excavated and backfilled in the mid-1960s, and two soak-away ponds formerly containing treated sanitary sewage. In addition, 4 areas of buried waste are located to the north and outside the main plant perimeter fence: a polymer and fiber landfill, a construction debris landfill, a 21-acre sludge disposal area, and a drum storage area which temporarily stored 2,000 to 3,000 drums of waste chemicals and solvents, including lab packs, from 1970 to 1978. The drums were removed and disposed of offsite by 1978. The primary contaminants of concern affecting the ground water include: VOCs including benzene and PCE, organics including phenols, and metals including chromium.

The selected remedial action for this site includes: ground water pump and treatment using air stripping, biological treatment, and carbon adsorption (if necessary), followed by discharge to the onsite wastewater treatment plant. If the treatment system effluent contains metals, such as chromium, above allowable discharge levels, the effluent will be treated using chemical precipitation. The estimated present worth cost for this remedial action is $2,032,000 with estimated present worth O&M of $1,069,230.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup will attain Federal or State MCLs, whichever is more stringent. Individual cleanup goals were not specified.

CELANESE FIBERS OPERATIONS, NC
First Remedial Action
March 23, 1988
Continued

INSTITUTIONAL CONTROL: Not applicable.

KEYWORDS: Air Stripping; ARARs; Benzene; Carbon Adsorption; Chromium; Direct Contact; Ground Water; Ground Water Treatment; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; Organics; PCE; Phenols; Safe Drinking Water Act; State Criteria; State Permit; Treatment Technology; VOCs.

CHEMTRONICS, NC
First Remedial Action - Final
April 5, 1988

ROD ABSTRACT

The Chemtronics site, an active waste disposal facility, is located in a rural area of Swannanoa, Buncombe County, North Carolina. The 1,027-acre site was developed as an industrial facility in 1952. Several companies operated the facility prior to its purchase by Chemtronics, Inc. in 1978. Waste disposal operations only occurred over approximately ten acres of the site. Existing records indicate the presence of twenty-three individual onsite disposal areas (DAs) which are grouped into six discrete areas: DA-6, DA-7/8, DA-9, DA-10/11, DA-23 and the acid pit. The site can also be divided into two geographical subsections referred to as Front Valley and Gregg Valley. Disposal practices prior to 1971 were not well defined; however, solid waste materials and possibly solvents were incinerated in pits dug in an area previously referred to as the burning ground and currently referred to as the acid pit area. Additionally, chemical wastes were disposed of in trenches beside this burning ground. Waste materials generated in the production of the chemical warfare agent, 3-quinuclidinyl benzilate (BZ), and the tear gas agent, o-chlorobenzylidene malononitrile (CS), were placed in 55-gallon drums with a neutralizing solution, and then buried onsite in trench-type landfills. From 1971 to 1975, small volumes of liquid wastes were disposed of in onsite pits/trenches. Solid wastes, rocket motors, explosive wastes, and other waste types also were burned in the burning ground area. From 1975 to 1979, Chemtronics, Inc. constructed pits/trenches, as needed, for the disposal of spent acid and various organic wastes. These pits/trenches were constructed in the burning ground area. In 1980, North Carolina ordered Chemtronics to discontinue all discharges to site pits/trenches. The pits subsequently have been back-filled. Starting in 1979, Chemtronics installed a 500,000 gallon lined lagoon over an old leaching field for the biotreatment of waste waters. The incompatibility of the liner with the brominated wastes introduced into the lagoon caused the lagoon to leach its contents. The biolagoon was reconstructed in August, 1980, with a different liner, and deactivated in 1984. In September 1984, the U.S. Army Toxic and Hazardous Materials Agency sampled two drums at the surface in DA-10/11. These drums were suspected of containing wastes from the production of BZ. Although no BZ was found, an immediate removal of these drums was initiated in January, 1985, due to heightened public awareness/involvement with the site. The primary contaminants of concern affecting the soil, sediments, ground water and surface water include VOCs, benzene, PCE, TCE, organics, metals, arsenic, pesticides, and explosives.

The selected remedial action for this site includes: multi-layer capping of DA 6, DA 7/8, DA-9, DA-10/11 and the acid pit area with fencing, placement of a vegetative cover over the cap, and installation of a gas collection ventilation system, if necessary; treatability studies for soils associated with DA-23 to determine the most appropriate soil fixation/stabilization/solidification process and mixing ratios followed by onsite capping; ground water pump and treatment which may include air stripping, carbon adsorption, or metal removal with treatment and discharge to be determined during design; sampling of pond water and sediments, and if necessary, treat using the ground water treatment system or the selected

soil treatment/containment process; and sediment, ground water, and surface water monitoring. The estimated present worth cost for this remedial action ranges from $6,247,300 to $8,242,900.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels were provided based on MCLs and several TBCs. Some individual goals include: TCE 0.005 mg/l (MCL), benzene 0.005 mg/l (MCL), PCE 0.007 mg/l (RSD), toluene 2.0 mg/l (PMCLG), RDX 0.035 mg/l (USAIWQC), TNT 0.044 mg/l (PPLV), lead 0.05 mg/l (MCL), and chromium 0.05 mg/l (MCL). Some individual soil cleanup goals include: PCBs 10 mg/kg (TSCA), RDX 95 mg/kg (PPLV), TNT 305 mg/kg (PPLV), and CS 43.3 mg/kg (PPLV).

INSTITUTIONAL CONTROLS: Controls will be implemented; however, none were specified.

KEYWORDS: ARARs; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Disposal; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Sediments; Soil; Solidification/Stabilization; State Criteria; Surface Water Monitoring; Toluene; Toxic Substances Control Act; Treatability Studies; Water Quality Criteria; VOCs.

FLOWOOD, MS
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Flowood site consists of 225 acres of mostly wetlands and lowlands, is located in the Town of Flowood, Rankin County, Mississippi, on the east side of the Pearl River. The site includes wastewater discharge areas and downstream areas adjacent to two industrial manufacturing facilities. The immediate area of the site includes a borrow-pit, a slough or canal used as a discharge area, a flood levee, and a cow pasture with an area of ponded water. The site is bordered to the north and east by various industrial and commerical operations, while forested areas are located west of the site. The nearest residence is more than 0.5 mile south of the site. Two manufacturing facilities have been owned and operated by a series of companies at the Flowood site since the 1950s. The northernmost facility manufactured corrugated boxes, and the southernmost facility produced ceramic tiles through the 1970s and stoneware cooking pots from the mid-1970s to the present. A routine industrial wastewater inspection conducted by the Mississippi Department of Natural Resources (MDNR) in the fall of 1982 revealed the unpermitted discharge of hazardous substances to the onsite canal. Subsequent sampling detected lead contamination in water and sediments from the canal. The MDNR began an emergency treatment and removal process to address the contaminated wastewater, but discontinued the process when higher levels of lead were found in the canal adjacent to one of the manufacturing sites. In 1983, EPA investigations revealed high lead levels in onsite sludges, sediments, and surface soil. The primary contaminant affecting the soil and sediments is lead.

The selected remedial action for this site includes: excavation and stabilization/solidification through chemical fixation of approximately 6,000 yd^3 of soil and sediments from all contaminated areas, followed by placement of the treated material in the excavated slough/lagoon area, capping with clean top soil and seeding to provide a vegetative cover; and ground water monitoring. The estimated present worth cost of this remedial action is $2,000,000 with a first year O&M cost of $25,000.

PERFORMANCE STANDARDS OR GOALS: A risk-based level of 500 mg/kg of lead has been set as the cleanup goal for soil and sediments.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Capping; Direct Contact; Excavation; Ground Water Monitoring; Leachability Tests; Lead; Metals; O&M; Onsite Disposal; Onsite Treatment; Safe Drinking Water Act; Sediments; Soil; Solidification; Stabilization; Wetlands.

GOODRICH, B.F., KY
First Remedial Action - Final
June 24, 1988

ROD ABSTRACT

The B.F. Goodrich (BFG) site is a one-acre area consisting of a landfill and waste burn pits and is located outside the zoned area of Calvert City, Marshall County, Kentucky. The site is situated on the eastern edge of a heavily industrialized area. It is bordered on the east by the Airco NPL site, on the west by the B.F. Goodrich Company, on the north by the Tennessee River and on the south by a State highway. (The BFG site and the Airco site were studied as one site for the RI/FS and their remediation will be combined since they are located adjacent to each other and share a somewhat common history of use.) The landfill is a former creek channel made suitable for landfilling by the construction of dikes on the north and west sides. The B.F. Goodrich Company used the landfill between 1965 and 1973 to dispose of approximately 54,000 tons of construction-type waste and plant trash. The company also operated the burn pit area where several pits were used to burn approximately 2.6 million gallons of liquid chlorinated organics. Additionally, 370 yd^3 of salt-brine sludge was buried in an area near the burn pits. From 1973 to 1980, excavation dirt was the only waste disposed at the site. An inspection conducted by the Kentucky Department of Natural Resources and Environmental Protection in May 1980 revealed a leaching problem along the river side of the landfill, and instructed the B. F. Goodrich Company to correct the problem. The Company resolved the problem in June 1980. The site was placed on the NPL in September 1983. The primary contaminants of concern affecting the soil, sediments and ground water are VOCs including benzene, toluene and 1,2-dichlorethane (EDC), and other organics including PAHs.

The selected remedial action for this site includes: excavation and consolidation of approximately 5,000 yd^3 of contaminated soil and sediments within the dikes and around the landfill from both the BFG and Airco sites, with onsite disposal in the former burn pit area followed by construction of an organic vapor recovery system and a RCRA cap over the burn pit; reconstruction of the dikes surrounding the landfill for flood prevention; upgrading of the landfill caps and installation of a leachate extraction system with onsite treatment of the leachate and offsite discharge to the local river; pump and treatment at the BFG plant site of ground water using air stripping and biological treatment or activated carbon adsorption, and discharge to the local river; possible treatment of ground water with an oil/water separator if ground water contains significant oil, and temporary onsite storage of oil with transport offsite to an oil recycling facility; access restrictions; and institutional controls to prevent residential development. The estimated capital cost for this remedial action (including all costs related to the Airco site) is $6,090,000 with present worth O&M estimated to be $3,130,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup will attain specific ACLs for the selected indicator chemicals at the site and include EDC (8.5 mg/l), benzene (8.5 mg/l), and TCE (8.5 mg/l). Contaminated subsurface soil in the burn pit areas will attain EDC level of 139 mg/kg, which is based on the allowable EDC ground water concentration.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent residential development and installation of drinking water supply wells.

KEYWORDS: ACL; Air Monitoring; Air Stripping; ARARs; Benzene; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Containment; Direct Contact; Deed Restrictions; Excavation; Filling; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Leachate Collection/Treatment; MCLs; Offsite Discharge; Oils; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; RCRA Landfill Specifications; Sediments; Soil; State Permit; TCE; Temporary Storage; Toluene; Vacuum Extraction; VOCs; Water Quality Criteria.

INDEPENDENT NAIL, SC
Second Remedial Action - Final
August 30, 1988

ROD ABSTRACT

The Independent Nail site, occupying 24.6 acres, is located near the town of Beaufort, South Carolina. The site is surrounded by fields, woodlands, and wetlands. The United States Fish and Wildlife Service in 1987 indicated that endangered and threatened species may exist in the area of influence of the site, however, these species have not been confirmed to be inhabiting areas that may be impacted by the operations at the site. An estimated 25 residents live within one quarter mile of the site. The Black & Johnson Company, previous owners of the site, manufactured metallic screws and fasteners. As part of the manufacturing process, the company discharged approximately 33,000 gallons per day of plating wastewater into an unlined infiltration lagoon. The discharge rate may have been as high as 75,000 gallons per day. The lagoon was in use from approximately 1969 to 1980. The South Carolina Department of Health and Environmental Control reported that wastewater contained some organic cleaning solvents and metals. In April 1980, the Black & Johnson Company ceased operation. Two months later, the Independent Nail Company purchased the plant and currently operates a panneling nail coating process, but does not discharge wastewater to the lagoon. The first remedial action at this site at this site addressed the contaminants in the soil and lagoon sediments. This remedial action at this site addresses ground water contamination. The primary contaminants of concern include chromium, zinc and cyanide.

The selected remedial action for this site addressing ground water is a no action remedy. The source control remedial action conducted at the site was determined to have little or no impact on ground water quality in the area of the site. This remedial action has no costs associated with it.

PERFORMANCE STANDARDS OR GOALS: The endangerment assessment conducted at the site indicated that there was no risk to human health or the environment from ground water.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Chromium; Ground Water; Inorganics; Lead; Metals; No Action Remedy.

NATIONAL STARCH, NC
First Remedial Action
September 30, 1988

ROD ABSTRACT

The National Starch and Chemical Corporation (NSCC) site is located in Rowan County, North Carolina, approximately five miles south of the city of Salisbury. The site consists of 500 acres and is occupied by the NCSS-owned Cedar Springs Road Plant which currently manufactures textile finishing and custom specialty chemicals. Land use adjacent to the site includes residential and industrial developments such as: warehousing operations on the east site; a farm on the south side; and residential areas bordering the southwest and north sides. Ground water in the aquifer beneath the site is currently used as a source of drinking water with the closest well being 2,200 feet northeast of the site. There are 1,539 homes within a 3-mile radius of the site that are outside of the city water lines and potential users of ground water for drinking and other domestic purposes. There is also potential for humans to directly contact or ingest contaminated waters through recreational uses of nearby creeks which receive the surface water runoff from the trench area. From 1971 to 1978, NSCC disposed of approximately 350,000 gallons of reaction vessel wash waters classified as D002 waste (corrosive waste with pH less than or equal to 2.0) in trenches constructed in a 5-acre tract of land located behind the plant. The waste consisted predominantly of salt brines, sulfuric acid solutions, sulfonating fats and oils, and solvents. The wastes were disposed of in several approximately 250 feet by 9 feet deep trenches running east/west and north/south. Trenches in this area also received liquid effluent from the plant where it percolated into the ground. After the percolation rate substantially declined, the trenches were backfilled and seeded. Site monitoring in 1976 and 1977 revealed shallow ground water contamination adjacent to or within the trench area. Consequently, the North Carolina Department of Natural and Economic Resources requested that NSCC cease onsite waste disposal activities. Since 1978, production plant process waters have been pretreated in a facility adjacent to and south of the production area and discharged to the Salisbury publicly owned treatment works (POTW). The two main areas of contamination identified at the site are the trench area and the wastewater lagoon area. This Record of Decision (ROD) will address remediation of ground water; a subsequent ROD will address soil contamination and, if necessary, sediment contamination. The primary contaminants of concern affecting the ground water, surface water, and sediments are VOCs including benzene, TCE, toluene and xylenes, and metals including arsenic and chromium.

The selected remedial action for this site includes: installation of a ground water interception and extraction system downgradient of the source area(s) with pretreatment prior to discharge to the POTW (pretreatment may include air stripping, filtration through an activated carbon filter, metal removal, or treatment through the company's existing lagoon system which includes presettling and surface aeration); and surface water and sediment monitoring. If the POTW declines to accept the treated ground water, it will be discharged to a local surface stream under an NPDES permit. The estimated present worth cost for this remedial action is $3,036,000 with annual O&M of $55,000.

PERFORMANCE STANDARDS OR GOALS: Eleven carcinogens and fourteen non-carcinogens have been identified as chemicals of concern at this site and have been given cleanup goals. For both carcinogens and non-carcinogens, cleanup levels are set at the MCL. If an MCL is not available, the cleanup goal for a carcinogen is set at the limit of detection for that substance, or for a non-carcinogen the goal is set at the R_fD or ACI equivalent. However, ethyl benzene will meet the proposed MCLG. Individual cleanup goals include: arsenic 10 ug/l (MCL), benzene 5 mg/l (MCL), TCE 5 ug/l (MCL), chromium 50 ug/l (MCL), toluene 2,000 ug/l and xylenes 350 ug/l. The State of North Carolina belatedly has identified ground water cleanup levels more stringent than those identified previously; however, even if EPA finds these standards to be applicable to the site, they would not alter the remedial action selected.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Containment; Consent Decree; Direct Contact; Drinking Water Contaminants; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Onsite Containment; Onsite Treatment; Organics; Public Exposure; Publicly Owned Treatment Works; Safe Drinking Water Act; Sediments; Surface Water; Surface Water Monitoring; TCE; Toluene; VOCs; Xylenes.

PERDIDO GROUNDWATER CONTAMINATION, AL
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Perdido Groundwater Contamination site is located in the Town of Perdido, Baldwin County, Alabama. Site contamination occurred as a result of a 1965 train derailment on the Louisville and Nashville Railroad (now CSX Transportation, Inc.). Chemicals (particulary benzene) from derailed tank cars spilled into drainage ditches, infiltrating the underlying aquifer. The area of ground water contamination covers approximately 15 acres and is centered downgradient about 300 yards from the derailment site. The Alabama Department of Public Health, Division of Public Water Supply (ADPWS) first documented reports of taste and odor problems in resident's water wells in 1981. Further studies showed benzene contamination in 6 of 27 wells, which led to supplying bottled water to 250 affected residents. In February 1983 EPA provided immediate removal funding to construct a water supply line to connect to a nearby town. CSXT voluntarily provided funds for and installed the water system in July 1983. The primary contaminant of concern affecting the ground water is benzene.

The selected remedial action for this site includes: ground water pump and treatment using air stripping or activated carbon adsorption with reinjection of treated water back into the aquifer, and air monitoring during operations; and ground water monitoring to measure success of the cleanup. The estimated capital cost for this remedial action is $169,000 with estimated annual O&M cost of $103,000.

PERFORMANCE STANDARDS OR GOALS: The target cleanup goal for ground water is benzene 5 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air Stripping; ARARs; Benzene; Drinking Water Contaminants; Granular Activated Carbon; Ground Water Treatment; MCLs; O&M; Onsite Discharge; Onsite Treatment; Organics; Public Exposure; RCRA; Safe Drinking Water Act; VOCs.

WAMCHEM, SC
First Remedial Action - FINAL
June 30, 1988

ROD ABSTRACT

The 21-acre Wamchem site is located in Burton, Beaufort County, South Carolina on a small island in the midst of a salt marsh near McCalleys Creek, a tidal stream. The creek is considered to be a habitat for the loggerhead turtle, a federally listed threatened species, and a probable habitat for the short-nosed sturgeon, also a federally listed endangered species. The water table aquifer at the site discharges into the creek, and has no distinct confining unit separating it from the underlying Floridian aquifer, the principal aquifer in the region. Between 1959 and 1972, the Beaufort Chemical and Research Company owned and operated the site, producing dyes for the textile industry. In 1972, M. Lowenstein Company purchased the facility and continued operations until 1981. When solvent recovery and recycling operations were discontinued at the site, M. Lowenstein Company closed the plant in 1982. Liquid wastes generated at the site were discharged to a drainage ditch leading to two unlined ponds. A ditch was later extended from one of the ponds, discharging wastes directly into McCalleys Creek. Waste treatment methods changed, and the ponds and ditches were replaced by an unlined holding pond and a waste lagoon in 1972; however, these were soon replaced by two spray fields and a concrete-lined holding pond in 1975. In 1977, the South Carolina Department of Health and Environmental Control (SCDHEC) required the company to use a spray-irrigation technique to improve its wastewater process. The wastes discharged onto the spray fields consisted of neutralized sulfuric acid and process water. Although the system was found to be in compliance with SCDHEC standards, ground water contamination was documented at the site in 1982. Current soil and ground water contaminants include: VOCs, benzene, toluene, xylenes, semi-volatiles, and organics.

The selected remedial action for this site includes: ground water pump and treatment using carbon adsorption with offsite discharge to a stream; excavation and low temperature thermal aeration of 2,000 yd^3 of contaminated soil followed by onsite disposal; and ground water monitoring. The estimated capital cost for this remedial action is $1,310,000, with annual O&M of $155,100.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals were based on Federal Ambient Water Quality Criteria. Soil cleanup goals were based on estimates of contaminants that would not result in future exceedances of AWQC in ground water at the source area due to soil contaminant leaching. Some individual goals include: benzene 2.43 mg/kg, toluene 34.47 mg/kg, total xylenes 67.58 mg/kg, and naphthalene 74.57 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; ARARs; Benzene; Carcinogenic Compounds; Clean Water Act; Direct Contact; Excavation; Flood Plain; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; Offsite Discharge; Onsite Treatment; Organics; Soil; Toluene; Treatment Technology; VOCs; Water Quality Criteria.

ZELLWOOD, FL
First Remedial Action - Final
December 17, 1987

ROD ABSTRACT

The 57-acre Zellwood site is located in the northwestern corner of Orange County, Florida, approximately one-half mile west of the unincorporated town of Zellwood. Situated in a rural area, the site is occupied by four industries and an open field containing a marshy wetland area. Approximately 300 homes, within a one-mile radius of the site, depend on private wells as their sole source of potable water. Between 1963 and 1971, Drum Service Company of Florida, a drum recycling facility, operated a wastewater disposal system without a regulatory permit, treating and disposing of generated wastewaters in two onsite evaporation/percolation ponds. In 1980, the company eliminated the use of these ponds for waste disposal and in August 1981 initiated drainage and removal of contaminated sediments from the ponds. Douglas Fertilizer and Chemical Company and Southern Liquid Fertilizer discharged wastewater from their production process into three unlined surface impoundments. Additionally, from 1960 to 1983, the Zellwin Farms Company facility, a vegetable washing and packing plant, discharged wastewaters from the vegetable washing process into a ditch. From 1971 through 1985, the Drum Service Company has had various types of waste treatment and disposal permits issued by the Florida Department of Environmental Regulation (FDER). To date, the Douglass Fertilizer and Chemical Company and the Zellwin Farm Company have not been permitted by FDER. In December 1982, EPA representatives discovered an abandoned drum storage area in the northern section of the Zellwood site. Based on unsubstantiated reports from area residents, material in this drum storage area may have been there for more than 20 years. In the fall of 1983, EPA oversaw a PRP removal action of the abandoned drum area. The primary contaminants of concern affecting the ground water, soil, sediments, and sludge include: organics, inorganics, metals and pesticides.

The selected remedial action for this site includes: excavation of soils and sediments with onsite incineration and testing of residuals to determine appropriate disposal; ground water pump and treatment with flushing of the treated ground water back through the abandoned drum area to facilitate cleanup of residual contamination; and a long-term ground water monitoring program for private potable water wells. The estimated present worth cost for this remedial action ranges from $41,264,000 to $61,908,000. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Not specified.

INSTITUTIONAL CONTROLS: Not applicable.

ZELLWOOD, FL
First Remedial Action - Final
(Continued)

KEYWORDS: ARARs; Chromium; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Treatment; Incineration; Inorganics; Metals; O&M; Onsite Discharge; Onsite Treatment; Organics; Pesticides; RCRA; Safe Drinking Water Act; Sediments; Sludge; Soils; Sole-Source Aquifer; State Guidance; Toluene; Treatment Technology; Wetlands.

ALLIED/IRONTON COKE, OH
Second Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The Allied/Ironton Coke site is located in the City of Ironton, Lawrence County, Ohio. This remedial action addresses the Goldcamp Disposal Area (GDA) operable unit of the site. The other operable unit, comprised of the coke plant, lagoons, and the tar plant, is addressed in a separate remedial action. The GDA is a four-acre disposal pit located in a mixed industrial/ business/residential area bounded by Third Street on the east and the Ohio River on the southwest. Several businesses and institutions are within 100 feet of GDA. Allied Chemical and Dye Company has owned the property since 1955. The GDA was a sand and gravel pit used for disposal of various chemical wastes from three sources between 1945 and 1977. The wastes include: anthracene residue, anthracene salts, phthalic anhydride residue, and miscellaneous process wastes from the Tar Plant; foundry sand containing heavy metals, phenolics, and oils from the Dayton Malleable Iron Company; and wastes disposed of by the Goldcamp Gravel Company. In 1977, Allied decided to discontinue use of the GDA for disposal of chemical wastes. Allied and its contractor, in consultation with the Ohio Environmental Protection Agency (OEPA), completed a closure project at the site in August 1980, which involved removal of standing liquids and filling and capping the site with clay. Subsequent hydrogeologic and water quality investigations indicated that there is ground water contamination at the site which may pose a threat to public health through migration. The volume of the disposal area is approximately 300,000 yd^3. In addition to this primary area of contamination, there is a zone of nonaqueous-phase contaminants which have migrated through the aquifer to the underlying impermeable bedrock layer. The extent of the contaminated area is uncertain, but the volume is estimated to be 156,000 yd^3. The surface of the GDA is also a source of contamination because many substances have oozed up through the existing cap. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, other organics including phenols and PAHs, and inorganics including cyanide.

The selected remedial action for this site includes: construction of a slurry wall around the disposal area from ground surface into the low permeability bedrock; installation of a multi-media RCRA cap over the surface of the disposal area; extraction and onsite treatment of ground water from inside and outside the containment system; provision of an alternate water supply for the Ironton Iron Company until ground water cleanup levels are met; imposition of deed restrictions to limit future uses of the property; and preparation of a supplemental RI/FS to identify the extent and nature of the nonaqueous-phase contaminant layer with implementation of the Agency-approved remedy for this contamination, if different from the present containment alternative. The estimated present worth cost for this remedial action is $13,130,000 with annual O&M costs of $515,000 for approximately 30 years.

ALLIED/IRONTON COKE, OH
Second Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: The selected remedy will meet ground water cleanup goals based on MCLs, AWQCs and 10^{-6} health-based levels. Specific goals include: ammonia 0.50 mg/l, chloride 250 mg/l, total cyanide 0.2 mg/l, phenolics 0.3 - 3.5 mg/l, benzene 0.005 mg/l, naphthalene 0.69 mg/l, and PAHs (benzo-a-pyrene indicator) 0.005 ug/l. The ground water cleanup ARARs and TBCs may not be technically feasible to attain, particularly for benzene and PAHs, therefore technical feasibility will be evaluated every five years throughout the remedial action. An ARAR waiver may be appropriate if it is determined that these standards cannot be met.

INSTITUTIONAL CONTROLS: Deed restrictions will be imposed to limit future uses of the property.

KEYWORDS: Alternate Water Supply; ARARs; Benzene; Capping; Carcinogenic Compounds; Clean Water Act; Containment; Deed Restriction; Drinking Water Contaminants; Drinking Water Standards; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; MCLs; Metals; O&M; Onsite Containment; Onsite Treatment; Organics; PAHs; Phenols; Public Exposure; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Slurry Wall; Soil; State Criteria; Treatment Technology; Venting; VOCs; Water Quality Criteria.

BELVIDERE LANDFILL, IL
First Remedial Action - Final
June 29, 1988

ROD ABSTRACT

The Belvidere Landfill (BL), occupying 19.3 acres of the 139-acre site, is located just outside the City of Belvidere, County of Boone, Illinois. The site is located within the 100-year flood plain of the Kishwaukee River, which is adjacent to the site. Located within the site boundaries are two ponds and a drum disposal area. The City of Belvidere owned the landfill from 1939 to 1973, operating first as a municipal landfill until 1965 and then as an industrial landfill until 1973. In late 1970, the City of Belvidere applied for a solid waste disposal permit. The application was to permit the disposal of 52 tons per day of domestic garbage, landscape wastes, partially dewatered sludge, and demolition material. However, in 1971, the operator disclosed that up to 100 tons per day of wastes were being deposited. This waste consisted of 35 tons of residential waste, 30 tons of industrial source waste, and 35 tons of commercial source waste. Approximately 790,000 yd^3 of waste were disposed of at the landfill. IEPA denied the City's permit application in January 1971, and the landfill was formally closed in 1973. Between 1975 and 1982, IEPA repeatedly cited the landfill for inadequate cover violations. In the summer of 1979, sand from adjacent areas and prairie plant vegetation were applied as a final cover. The primary contaminants of concern affecting the soil and ground water include: organics, PCBs, PAHs, metals, and lead.

The selected remedial action for this site includes: RCRA Subtitle C capping over the 19.3-acre landfill; treatment or containment of soil from the drum disposal area following resampling to determine the magnitude of PCB contamination; ground water pump and treatment possibly using air stripping with discharge to either the Kishwaukee River or the city treatment plant; ground water monitoring; pond and river fish monitoring; installation of an upgraded fence; deed restrictions to control unacceptable onsite activities and construction; and flood control measures to prevent erosion of the cap and landfill contents. The estimated capital cost for this remedial action is $5,900,000 with annual O&M of $271,000.

PERFORMANCE STANDARDS OR GOALS: The ground water extraction and treatment system will operate until a 10^{-6} cumulative life-time cancer risk is met at the point of compliance. PCBs greater than 50 mg/kg will be disposed of, or incinerated, offsite. PCBs less than 50 mg/kg will be consolidated on the landfill. Quantitative goals were not specified for other contaminants.

BELVIDERE LANDFILL, IL
First Remedial Action - Final
(Continued)

INSTITUTIONAL CONTROLS: Access restrictions involve upgrading the existing fence to prevent recreational use of the landfill and to ensure the integrity of the cap. Deed restrictions include controlling unacceptable onsite construction and activities.

KEYWORDS: Air Stripping; ARARs; Capping; Carcinogenic Compounds; Deed Restrictions; Direct Contact; Flood Plain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; O&M; Offsite Discharge; Onsite Treatment; Organics; PAHs; PCBs; Soil; Toxic Substances Control Act; Treatability Studies.

COSHOCTON LANDFILL, OH
First Remedial Action - Final
June 17, 1988

ROD ABSTRACT

The Coshocton City Landfill (CCL), an 80-acre landfill, is located in Franklin Township, Coshocton County, Ohio. The landfill is built on abandoned, subsurface strip mines, where an extensive network of mine shafts were developed. CCL is located between two small intermittent creeks that drain toward the Muskingum River, 1.5 miles to the west of the site. The area is characterized by considerable topographic relief, with small streams situated between steep rolling hills. Most of the surrounding land is either woodlands or pasture land used for cattle grazing. The landfill property was used in the early 1900s, and again from the mid-1950s until mid-1979, for subsurface shaft mining of coal. The city conducted landfill operations at the site between 1968 and 1979; however, the operations were not well recorded. The waste received at the landfill consisted of mixed municipal refuse and industrial wastes including relatively inert solid scrap wastes, nonhazardous materials, and hazardous liquid waste types such as spent chlorinated solvents, non-chlorinated flammable solvents, resins, and prasticizers. Much of the landfilled waste is situated in the void created by abandoned strip mine operations. Some waste was also reportedly placed in shallow excavations in the southern portions of the site. Currently, portions of the landfill site are covered with what appears to be mine spoil materials. The cover on the site however is, not consistent, with little or no cover in some areas. In addition, standing water is observed in several areas. Scattered surface deposits of drums and other metal objects are present at the site. Numerous leachate seeps exist on portions of the landfill. The primary contaminants of concern affecting the surface and ground water at this site include: carbon disulfide, TCE, PAHs, chlorinated and non-chlorinated solvents, and heavy metals (mostly arsenic).

The selected remedial action for this landfill includes: installation of a 2-foot low permeability soil cap over the landfill, with top soil and vegetation; imposition of deed restrictions, including fencing; filling and grading the necessary areas; and possible installation of a gas collection and venting system, as well as a leachate collection system and a drainage layer. This remedial action will also include routine ground and surface water and sediment monitoring to identify changes in contamination concentrations. The implementation of this remedial action will entail a capital investment of $8,010,000 with a present value of O&M cost of $910,000 associated with the remedy.

PERFORMANCE STANDARDS OR GOALS: The goal of this remedy is to reduce the contaminant concentrations in the soil, surface and ground water. The current health-based risk levels for these media are: 3×10^{-6}, 3×10^{-6} and 3×10^{-4} (all for arsenic), respectively.

INSTITUTIONAL CONTROLS: Deed restrictions would support and strengthen the effectiveness of the soil cover in limiting direct contact.

KEYWORDS: ARARs; Arsenic; Capping; Deed Restrictions; Direct Contact; Filling; Ground Water; Ground Water Monitoring; Leachate Collection System; MCLs; Metals; O&M; PAHs; Sediments; Soil; Solvents; Surface Water; Surface Water Monitoring; TCE; Toluene.

EAU CLAIRE MUNICIPAL WELL FIELD, WI
First Remedial Action - Final
March 31, 1988

ROD ABSTRACT

The 500-acre Eau Claire Municipal Well Field (ECMWF) site is located in northwestern Eau Claire County and southwestern Chippewa County, Wisconsin, at the confluence of the Eau Claire River and the Chippewa River. ECMWF supplies drinking water to approximately 57,600 residents and numerous commercial establishments in the city of Eau Claire and Washington Township. Ground water from five municipal wells in the north well field is contaminated with VOCs. The contamination at the ECMWF site has been characterized as two separate plumes with the estimated volume of contamination at Plume 1 and 2 of 1.9×10^8 ft^3 and 2.6×10^8 ft^3, respectively. The Chippewa River is not believed to be affected by this VOC contamination due to municipal well pumping which prevents ground water discharge into the river. In March 1981, as part of the EPA Ground Water Supply Survey, the Wisconsin Department of Natural Resources (WDNR) tested the Eau Claire municipal water supply for VOCs and did not detect VOCs at levels of immediate concern. Additional testing of the city's active production wells, in January 1982, showed VOC concentrations below health advisory levels. Concerned about the future use of the water supply, additional testing was conducted in September 1982 and January 1983 to identify the source and extent of VOC contamination. Several residential wells reported detectable levels of VOCs including 1,1-dichloroethene concentrations in excess of the WDNR health advisory. The primary contaminants of concern affecting the ground water are VOCs including: chloroform, DCE, dichloroethene, PCE, TCE, and trichloroethane.

The selected remedial action for this site includes: ground water pump and treatment using the existing air stripper with discharge of treated water to the municipal water system and untreated water to the Chippewa River; and provision of municipal water to private well users within or near the area of ground water contamination. The estimated capital cost for this remedial action is $1,214,200 with annual O&M of $396,700.

PERFORMANCE STANDARDS OR GOALS: Individual contaminant goals are below MCLs and State Health Advisory levels, are based on the achievement of an additive 10^{-6} risk level. The target cleanup levels (TCLs) for Plume 1 include: trichloroethene 0.5 ug/l, 1,1-dichloroethene 0.1 ug/l, and tetrachloroethene 0.01 ug/l. The TCLs for Plume 2 include: trichloroethane 0.4 ug/l, chloroform 0.06 ug/l, 1,1-dichloroethene 0.007 ug/l, and tetrachloroethene 0.09 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Alternate Water Supply; ARARs; Clean Water Act; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Discharge; Onsite Treatment; PCE; Public Exposure; RCRA; Safe Drinking Water Act; TCE; VOCs; Water Quality Criteria.

FOREST WASTE DISPOSAL, MI
Second Remedial Action - Final
March 31, 1988

ROD ABSTRACT

The Forest Waste Disposal site consists of an 11-acre, abandoned municipal and industrial waste landfill and 9 surface impoundments. It is located in Genesee County, Michigan, 20 miles northeast of Flint, and is surrounded by agricultural land and undeveloped woodlands and wetlands. An estimated 20 to 30 households are located within a quarter mile of the site. Wetlands in the site vicinity drain into Butternut Creek which eventually discharges into the Flint River. The site is underlain by two drinking water aquifers. Forest Waste Disposal conducted landfill operations from 1972-1978, receiving limited types of liquid industrial waste, general household refuse, and drummed waste until 1978. Specific waste material found within the landfill includes PBB-contaminated feed, septic sludge, and drums containing primarily solid and liquid VOCs in high concentrations. The operator also was suspected of discharging liquid wastes into the landfill and onto the ground. In 1982, the site was placed on the NPL. This remedial action addresses the landfill and contaminated ground water on the east end of the site. Contamination from the nine waste lagoons is considered to be the primary source affecting ground water and is addressed in a previous remedial action, which includes: offsite treatment and disposal of lagoon liquid, with onsite treatment and offsite disposal of lagoon sediment, sludge and soil. The primary contaminants of concern affecting the soil and ground water are VOCs including toluene and TCE; other organics including pesticides, PAHs and PBBs; and metals including arsenic and lead.

The selected remedial action for this site includes: removal and either onsite or offsite incineration of approximately 4,000 drums and 1,000 yd^3 of associated contaminated soil; installation of a containment system including a RCRA cap, slurry wall, dewatering system and a leachate collection system; and treatment and disposal of collected leachate. The ground water remedy includes: deed restrictions to prevent use of the ground water as a drinking water source; access restrictions; and ground water monitoring. The estimated present worth cost for this remedial action is $23,820,000 with an annual O&M of $440,500.

PERFORMANCE STANDARDS OR GOALS: The remediation of the landfill will prevent migration of contaminants to a drinking water aquifer in excess of MCLs, lifetime health advisories, and noncarcinogenic reference doses, and will result in an excess lifetime cancer risk range of 10^{-4} to 10^{-7}. The remedial action also will prevent migration to surface water bodies in excess of Federal and State water quality criteria. Cleanup goals for individual chemicals were not specified.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent use of the ground water onsite and from areas adjacent to the site as a drinking water source.

FOREST WASTE DISPOSAL, MI
Second Remedial Action - Final
Continued

KEYWORDS: Air Monitoring; Alternate Closure; Arsenic; Capping; Carcinogenic Compounds; Containment; Deed Restriction; Direct Contact; Ground Water; Ground Water Monitoring; Inorganics; Leachate Collection/Treatment; Lead; MCLs; Metals; O&M; Onsite Treatment; Organics; PAHs; Pesticides; RCRA; RCRA Landfill Specifications; State Criteria; Soil; Solvents; Slurry Wall; TCE; Toluene, VOCs; Water Quality Criteria; Wetlands; Woodlands.

FORT WAYNE REDUCTION, IN
First Remedial Action - Final
August 26, 1987

ROD ABSTRACT

The 35-acre Fort Wayne Reduction site (FWD) is a former municipal landfill/waste disposal facility located along the Maumee River just east of the city of Fort Wayne, Allen County, Indiana. Two onsite areas are designated as wetlands. In addition, the site lies within a 100-year flood plain. The primary land use in the general area is light industrial and commercial. In addition, other landfills, a wastewater treatment plant, and sludge drying beds are located along the Maumee River in the vicinity of the site. Two residential communities are located approximately one-half mile from the site. Before 1967, the site was uncultivated farmland often used for the dumping of unknown waste. The site accepted residential and industrial wastes from 1967 to 1976. Few records were kept on the volume and composition of wastes, or on the industries that generated the wastes. From May 1967 to August 1970, FWD was issued a county permit for public disposal of garbage and rubbish. Wastes were incinerated and the residual ash disposed of onsite. In 1970, FW changed its name to National Recycling Corporation (NRC) and built a recycling plant which apparently became inactive after February 1975. Inspection reports indicated that deposited refuse included: industrial and liquid wastes, municipal wastes, garbage, paper, and wood. A 40- to 60-foot diameter pit adjacent to the Maumee River contained pools of volatile liquids. Wastes were disposed of into the pit by cutting off the drum tops and emptying the contents into the pit. NRC operation became part of Service Corporation America (SCA) in 1973. In 1974, SCA was denied a municipal refuse permit due to site closure problems encountered following high water levels. Hazard Ranking System records indicate the entire site's waste quantity was equivalent to 2,820 fifty-gallon barrels. In 1984, Waste Management Inc. (WMI) acquired SCA and conducted an initial site investigation. The site has been inactive since 1976. The site consists of two characteristically different areas reflecting its historical use: the eastern half of the site was used as the municipal/general refuse landfill (approximately 15 acres), and the western half of the site (approximately 5 acres) was used for disposal of industrial wastes, building debris, barrels of unidentified wastes, and residual ash from earlier incineration operations. Presently, soil and ground water are contaminated with 43 chemicals of concern including: metals, organics, PCBs, PAHs, phenols, and VOCs.

The selected remedial action for the eastern portion of the site includes: deed and access restrictions; soil capping consistent with State solid waste closure requirements; and long-term ground water monitoring. The selected remedial action for the western portion includes: excavation, re-consolidation, and on- or offsite incineration of approximately 4,600 drums containing liquids from Area C, followed by soil capping in accordance with "hybrid" (alternate landfill) closure requirements; ground water collection and treatment, if necessary, with discharge to the river; deed and access restrictions; provision and maintenance of flood protection measures for the portions of the site within the 100-year floodplain; and compensation for any loss of wetlands due to remedy construction by enhancing onsite wetlands. The estimated present worth cost for this remedial action is $10,020,000.

PERFORMANCE STANDARDS OR GOALS: Contaminant levels in the area of the municipal landfill do not pose a threat to human health or the environment. Ground water monitoring will ensure protection of the river through the use of ACLs as a performance standard. Specific goals will be determined during design. MCLs are not considered ARARs, since ground water is not used as a drinking water source. The fate of ground water in the waste disposal facility area will be determined during design.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to control future development and ground water use at the site.

KEYWORDS: ACL; Alternate Closure; ARARs; Arsenic; Benzene; Capping; Chromium; Clean Air Act; Clean Water Act; Deed Restriction; Direct Contact; Excavation; Flood Plain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Institutional Controls; Lead; Metals; Offsite Discharge; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Phenols; RCRA; RCRA Closure Requirements; Sediments; Soil; State Criteria; Toluene; Treatment Technology; VOCs; Wetlands.

IMC/TERRE HAUTE, IN
Second Remedial Action - Final
June 22, 1988

ROD ABSTRACT

The IMC/Terre Haute site is located in southeastern Terre Haute, Vigo County, Indiana. The 37-acre site is bordered on the west by the Milwaukee, St. Paul, and Pacific Railroad and on the east by the Louisville Railroad. The site is part of a semi-industrialized area of Terre Haute and is 1.8 miles east of the Wabash River and 1 mile north of the Thompson ditch. A waste disposal area, encompassing approximately six acres, is located in the northeastern portion of the plant site. From 1946 to 1954 a small facility on a six-acre segment of the property manufactured, packaged, and warehoused technical-grade benzene hexachloride (BHC-tech). This material was confined to areas sold to insecticide manufacturers as a raw material for the production of insecticides, including lindane. The site has been owned by International Minerals and Chemical Corporation since 1975. IMC conducted surficial and subsurficial soil sampling in 1979, finding that contamination was confined to areas within seven feet of the surface and well above the ground water table. Seven ground water monitoring wells were installed at the site, and samples indicated measurable BHC concentrations in two of the wells. In 1980, approximately 28,500 yd^3 of soil, rubble, piping and other debris were excavated and placed in a secure clay-capped mound to prevent offsite migration of BHC-tech. The cap system included a surface drainage collection system and soil gas venting. The concentration in ground water of lindane, the gamma isomer of BHC, declined relatively quickly after construction of the mound and has continued to decline at a slower rate since 1983. The soil cleanup and mound construction has proven to be effective in containing the source of BHC-tech and in reducing ground water contamination to MCL and MCLG concentrations. The primary contaminants of concern are lindane and total BHC.

The selected remedial action for this site is no further action with a maintenance program, which includes: inspection of the existing cap quarterly, and maintenance of the vegetative cover; initiation of a ground water monitoring program (sampling of upgradient and downgradient wells semi-annually for the next five years and then annually until 2010); access restrications; and establishment of a contingency plan. The estimated present worth cost for this remedial action is $159,000 for O&M of the existing system.

PERFORMANCE STANDARDS OR GOALS: Contaminant levels immediately downgradient of the mound are well below the MCL (4.0 ug/l) and MCLG (0.2 ug/l) for lindane in drinking water. Should contamination reach the MCLG level, or show a consistent, significant (order of magnitude) rise above prevailing levels over more than two monitoring periods, additional samples will be taken to determine if remedial action may be necessary.

INSTITUTIONAL CONTROLS: Deed restrictions will be imposed on land use of the property.

KEYWORDS: ARARs; Deed Restriction; Direct Contact; Drinking Water Standards; Ground Water Monitoring; Institutional Controls; Landfill Closure; MCLs; MCLGs; No Action Remedy; O&M; Onsite Disposal; Pesticides; Public Exposure; RCRA; RCRA Closure Requirements; Venting.

KUMMER SANITARY LANDFILL, MN
Second Remedial Action
September 30, 1988

ROD ABSTRACT

The Kummer Sanitary Landfill is a 40-acre site located in Northern Township, Beltrami County, Minnesota. The site consists of a 35-acre landfill and the Kummer residence located in the extreme southeast corner of the property. To the north and west of the site, the land is sparsely settled with farm residences. A large residential community lies about 1,000 feet to the east and west, and the City of Bemidge is located 0.5 mile south of the site. The city uses ground water for its drinking water; its wells are 0.25 mile west of the site. There are numerous wetlands and lakes within the area of the site. Between 1971 and 1983 the site operated as a sanitary landfill, accepting mixed municipal waste. Landfill operations consisted of excavating trenches, filling the trenches with waste materials, and covering the fill with onsite sand and gravel deposits. The trenches may have been excavated to the water table and the waste placed in direct contact with ground water. Beginning in 1974, demolition debris consisting of fly ash and sawdust were disposed of onsite. In 1982 and 1983 the Minnesota Pollution Control Agency sampled ground water from onsite monitoring wells and discovered 19 VOCS including TCE, PCE, and benzene. In 1984, VOCs were also discovered in offsite shallow residential wells downgradient of the site; consequently, in 1985 the site was ordered closed. In June 1985 a ROD was signed to provide an alternate water supply to approximately 244 homes affected by contaminated ground water. The primary contaminants of concern affecting ground water and soil are VOCs such as TCE, PCE and benzene.

The selected remedial action for this site includes: site grading and consolidation of soil and other waste material; placement of a sloping foundation layer of natural soil fill; capping with a cover system consisting of a gas control layer, a barrier layer of low permeability material (clay or flexible synthetic membrane), and a drainage layer with placement of cover soil and a vegetative layer; access and deed restrictions limiting future site use; and groundwater and landfill gas monitoring. The estimated capital cost of the selected remedy is $7,400,000 to $12,500 for the clay cap and $6,900,000 to $11,200,000 for the synthetic membrane, with annual O&M costs of $35,000 and $33,000, respectively.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Access and deed restrictions will be implemented to limit future use of the property.

KEYWORDS: Benzene; Capping; Consolidation; Direct Contact; Ground Water; Ground Water Monitoring; O&M; PCE; RCRA; Soil; State Criteria; TCE; VOCs; Wetlands.

LASALLE ELECTRICAL UTILITIES, IL
Second Remedial Action - Final
March 30, 1988

ROD ABSTRACT

The LaSalle Electrical Utilities (LEU) site is located in the city of LaSalle, west-central LaSalle County, in north-central Illinois. There are approximately 190 people and 70 residences located within one-eighth mile of the LEU property. LEU, a former manufacturer of electrical equipment, began operating prior to World War II. Between the late 1940s and 1978, PCBs were utilized in the production of capacitors. Undocumented reports allege the application of PCB-contaminated waste oils as a dust suppressant both on and off the property until as late as 1969. Following the regulation of PCBs, manifests document the disposal of PCBs at all regulated facilities. Beginning in September 1975, numerous government agencies conducted various inspections and issued complaints and orders to the LEU company as a result of its manufacturing and handling practices. Soil sampling conducted by the Illinois Environmental Protection Agency (IEPA) in December 1980 documented onsite PCB contamination. Continued soil sampling revealed offsite contamination in March and May 1981. The IEPA ordered the company to cease operations in May 1981. The U.S. EPA conducted Immediate Removal Actions that involved fencing the LEU property and capping a portion of the heavily contaminated onsite property; capping contaminated offsite property to the south of the site; and staging, sampling, and packaging PCB waste material for future disposal. The first operable unit ROD, signed September 19, 1986, addressed offsite soil contamination. This second remedial action operable unit addresses PCB and VOC contamination in soil, sediments, building structures, and ground water.

The selected remedial action for this site includes: excavation and onsite incineration of contaminated soil and replacement with clean fill; high pressure flushing and mechanical cleaning of affected sewer lines; excavation and onsite incineration of contaminated sediment from the unnamed creek downstream of the storm sewer discharge; ground water collection and onsite treatment using phase separation, filtration, and air stripping with discharge to the local waste water treatment plant via sanitary sewers; and demolition and offsite disposal of contaminated LEU building structures. The estimated present worth cost for this remedial action is $34,495,180.

PERFORMANCE STANDARDS OR GOALS: Contaminated ground water will be collected to achieve MCLs for VOCs (specific chemicals and associated values not specified) and PCBs 1 ug/l. Soils will be excavated consistent with the cleanup levels selected in the 1986 ROD. Specifically, the levels for PCBs are 5 mg/kg in surface soils and 10 mg/kg at depths greater than one foot when clean fill material is used to return the area to its original grade.

LASALLE ELECTRICAL UTILITIES, IL
Second Remedial Action - Final
(Continued)

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Incineration; MCLs; Offsite Discharge; Offsite Disposal; Onsite Treatment; PCBs; RCRA; Safe Drinking Water Act; Sediments; Soil; Toxic Substances Control Act; Treatment Technology; VOCs.

LONG PRAIRIE, MN
First Remedial Action - Final
June 27, 1988

ROD ABSTRACT

The Long Prairie site, as defined by the extent of the plume of contaminated ground water, extends 2,100 feet by 1,000 feet in Long Prairie, Todd County, Minnesota. The Long Prairie River flows within 500 feet of the contaminant plume. In August and October 1983, routine municipal well monitoring by the Minnesota Department of Health (MDH) indicated contamination in two of five municipal wells. The MDH ordered the two wells shut down in October 1983, and in November 1983, issued an advisory to provide bottled water for area residents. About 50 of the area's 300 private wells were affected by the ground water contamination. Since the advisory was issued, 39 of the 45 homes using contaminated ground water have been connected to the municipal drinking water system. Well monitoring in 1984 implicated an area dry cleaning operation as the potential source of contamination. The primary contaminants of concern affecting 7,000,000 gallons of ground water and 3,800 yd^3 of soil are VOCs including DCE, PCE, and TCE.

The selected remedial action for this site includes: ground water pump and treatment using air stripping with discharge to the river; spill treatment using active soil venting; and ground water monitoring. The estimated capital cost for this remedial action is $890,000 with annual O&M of $390,000 for year 1 and $250,000 for years 2-5. The estimated present worth cost for this remedial action is $2,000,000.

PERFORMANCE STANDARDS OR GOALS: Remediation will attain a 10^{-6} increased cancer risk level. Based on this level, PCE will be treated to 1,200 mg/kg and 5 ug/l in soil and ground water, respectively. The target ground water cleanup level for TCE is expected to be below the MCL value of 5 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Carcinogenic Compounds; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Discharge; Onsite Treatment; PCE; Safe Drinking Water Act; TCE; Venting; VOCs.

MASON COUNTY LANDFILL, MI
First Remedial Action
September 28, 1988

ROD ABSTRACT

The Mason County Landfill site is located three miles south of the City of Ludington, Mason County, Michigan. The site occupies approximately 18 acres of a predominantly rural area in Pere Marquette Township. Approximately 10 acres of the site were used as a landfill. Less than 500 feet from the landfill there is a wetland area which drains into Babbin Pond, the headwaters of Iris Creek. There are 14 residential wells within a 0.5 mile radius of the landfill. The population within a 3-mile radius of the site is estimated to be 1,112. The Mason County Department of Public Works (DPW) leased the property in 1971 and entered into an agreement with Acme Disposal, Inc. to operate the site as a sanitary landfill. Although the Michigan Department of Natural Resources (MDNR) documented that slurry and sludge wastes from local industries were being dumped at the landfill, the site's license was renewed annually until it was closed in August 1978 after reaching capacity. Public concerns over the water quality in Iris Creek prompted the DPW and MDNR to review closure activities. The site is currently owned by Mason County as result of a settlement with two property owners who filed suit against the county. In 1983, a clay cap was installed over the landfill and berms and storm drains were constructed to improve site drainage. Two surface aerators were installed in Babbin Pond to facilitate biodegradation of organic matter and 15 gas vents were placed in the top of the landfill. The site has been separated into two operable units; one for the landfill contents and one for the ground water. This source control remedial action addresses the landfill contents. Contamination of the shallow and deep aquifer will be addressed in a subsequent remedial action. Site investigations indicate that contamination of surface water, surface sediment, soil, and offsite air quality are not sufficient to warrant remedial action. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, and xylene.

The selected remedial action for this site includes: construction of a RCRA cap over the landfill; access restrictions; deed restrictions on and near the site to prohibit use of the shallow aquifer; and ground water monitoring. The estimated present worth cost for this remedial action is $2,800,000, with present worth O&M costs of $1,000,000 over 30 years.

PERFORMANCE STANDARDS OR GOALS: The general remedial action goals are to prevent direct contact with contaminant sources and to minimize future release of contaminants. Establishment of performance standards for the cleanup of ground water contamination is deferred until a remedy is selected for the ground water operable unit.

INSTITUTIONAL CONTROLS: Deed restrictions will prohibit future site development or installation of water supply wells on the site.

MASON COUNTY LANDFILL, MI
First Remedial Action
September 28, 1988
(Continued)

KEYWORDS: Aeration; Air Monitoring; ARARs; Benzene; Capping; Carcinogenic Compounds; Containment; Deed Restriction; Direct Contact; Drinking Water Contaminants; Ground Water Monitoring; Institutional Controls; Landfill Closure; O&M; Onsite Containment; Organics; PCE; Public Exposure; RCRA; RCRA Closure Requirements; Sludge; State Criteria; TCE; Venting; VOCs; Wetlands; Woodlands; Xylenes.

MID-STATE DISPOSAL LANDFILL, WI
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Mid-State Disposal (MSD) site is an abandoned municipal and industrial waste landfill located in central Wisconsin, in Cleveland Township, Marathon County, about 4 miles northeast of Stratford. The area surrounding the site includes an abandoned railroad track partially bounding the west and north, two offsite sludge disposal lagoons owned by Weyerhaeuser, Inc. to the northeast, and private property to the south. Site runoff enters nearby waterways including the Rock Creek and the Eau Plune River via unnamed tributaries. Additionally, ground water from the site is believed to be discharging into a ravine 500 feet south of the site. MSD conducted landfilling operations from 1970-1979, receiving municipal, industrial and commercial wastes as well as construction and demolition debris. Specific wastes received included papermill sludges, asbestos dust, solvents, pesticides, paint sludges and metals. Four areas of contamination have been identified at the site. These are: a 25-acre landfill located in the center of the site and referred to as the Old Mound area, which contains municipal wastes, papermill sludges, asbestos dust, pesticides and solvents; a 5-acre interim expansion landfill located to the west of the Old Mound area and referred to as the Interim Expansion area, which reportedly contains wastes similar to the Old Mound area with the exception of papermill sludges; a 3-acre sludge lagoon located northwest of the Old Mound area which allegedly contains papermill sludges; and an area along the western edge of the property where leachate ponding had occurred. Numerous environmental problems and permit violations were noted by the Wisconsin Department of Natural Resources (WDNR) during a site inspection in 1974. In 1979, Weyerhaeuser Company, a generator of waste disposed at the facility, agreed to properly abandon the facility. The pond leachate was removed, and the three waste disposal areas were covered. Leachate collection systems were installed in late 1979 for both the sludge lagoon and the Interim Expansion area; only the leachate collected from the latter is currently removed and treated offsite. Subsequent investigations revealed that ground water has been contaminated by leachate percolating from the waste disposal areas and the leachate pond down to the underlying aquifer. The primary contaminants of concern affecting the ground water, surface water and soil are VOCs including benzene, PCE and TCE, and metals.

The selected remedial action for this site includes: installation of new soil/clay caps for the lagoon and landfills; site monitoring that includes ground water, surface water, and landfill gas monitoring; offsite ground water monitoring; provision of an alternate water supply for nearby residences; improvement of surface water drainage; leachate and ponded water collection and offsite treatment; access restrictions; institutional controls to prevent well installation onsite; and in situ solidification/stabilization of sludge as necessary for cap support, and landfill gas flaring, if deemed necessary during pre-design. The estimated present worth for this remedial action is $16,000,000 with annual O&M of $22,000 for the first year, and $100,000 for years 2-30.

MID-STATE DISPOSAL LANDFILL, WI
First Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: Ground water will gradually meet state standards and 10^{-6} cancer risk levels for ingestion as a result of natural attenuation and a decrease in leachate contamination.

INSTITUTIONAL CONTROLS: Institutional controls will be established to prevent onsite well installation and soil excavation.

KEYWORDS: Air Monitoring; Alternate Water Supply; ARARs; Benzene; Capping; Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; Metals; Offsite Treatment; O&M; Organics; PCE; Pesticides; Sludge; Soil; Solidification/Stabilization; Solvents; Surface Water; Surface Water Diversion; TCE; Treatability Studies; Treatment Technology; VOCs.

NL/TARACORP/GOLDEN AUTO PARTS, MN
Second Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The NL/Taracorp/Golden Auto Parts site is located in St. Louis Park, Hennepin County, Minnesota. A secondary lead smelting facility operated onsite from 1940 until 1982. Land use adjacent to the site is light industry. There are residential areas within 0.25 mile of the site to the north, east, and west. Aquifers beneath the site serve as primary sources of drinking water in the area, supplying 90 percent of all ground water used in the region. The site was originally owned by NL Industries, Inc., but was later divided and each portion sold to a succession of owners. One of these owners, Taracorp, owned and operated the lead smelting facility from August 1979 until February 1981. Secondary lead smelting operations recovered lead from lead plates, battery fragments, and lead containers. The industrial operations and onsite waste disposal activities resulted in elevated lead levels in air and onsite soil. Under a Consent Order, NL conducted onsite investigations and cleanup activities between 1985 and 1988 including soil remediation, capping the site with asphalt, and establishing a long-term ground water monitoring program. As part of the Consent Order, NL was also required to investigate and, if necessary, clean up soil near the site possibly contaminated by windblown contaminants. This remedial action addresses the possibility of offsite soil contamination. Investigations indicate that offsite soil does not contain elevated levels of lead attributable to the site. There are no contaminants of concern attributable to the site affecting the offsite soil.

The selected remedial action for this site is a no action remedy. The one residential yard that exceeds state and ATSDR guidance levels for soil lead is not clearly attributable to the site, but will be addressed through a cooperative cleanup by NL Industries. There is no capital cost or O&M associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: The no action remedy attains the state ARAR of 1,000 mg/kg for soil lead, as well as the ATSDR guidance level of 500 to 1,000 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Consent Decree; Direct Contact; Lead; No Action Remedy; State Criteria.

NINTH AVENUE DUMP, IN
First Remedial Action
September 20, 1988

ROD ABSTRACT

The Ninth Avenue Dump (NAD) is a 17-acre inactive chemical and industrial waste disposal site located in Gary, Indiana. NAD is located in a low-lying area with poor drainage. Prior to filling, the site consisted of parallel ridges separated by wetlands areas. Hazardous waste disposal activities occurred at the site from early to mid 1970s with some filling continuing until 1980. The site accepted dry industrial, construction and demolition waste, oil, solvents, paint solvents and sludges, resins, acids, and flammable, caustic and arsenic-contaminated materials. A small-scale auto wrecking operation was observed at the property in 1975 by the Indiana State Board of Health (ISBH) which also documented the presence of 10,000 55-gallon drums at the site, many of which were empty. Additionally, the ISBH estimated that approximately 500,000 gallons of liquid industrial waste and 1,000 buried drums were present at the site. Subsequent inspection revealed portions of discarded auto batteries, drummed liquid wastes, and abandoned tanker trucks. In 1975 and 1980 EPA ordered the site operator to initiate surface cleanups. Subsequently, he removed some barrels, junk cars, and trucks. This first operable unit addresses remediation of an oil layer floating on the ground water surface, the principal environmental threat at the site. The quantity of oil under the site is estimated at 250,000 to 700,000 gallons, of which 100,000 to 500,000 gallons are estimated to be recoverable. Several organic and inorganic contaminants have been detected in the oil in higher concentrations than in other media. Oil seeps have been observed in onsite ponds leading to concerns that the oil may be affecting aquatic life, and an oil sheen has been seen on several surface water bodies. The second operable unit will address buried waste, contaminated soils, and contaminated ground water. The primary contaminants in the oil layer include: VOCs, benzene, toluene, xylene, PAHs, organics, PCBs, metals, and cyanides.

The selected remedial action for this site includes: construction of a soil-bentonite slurry wall to completely surround the hydrocarbon layer; separate extraction of oil and ground water through a series of central extraction wells, followed by storage of the recovered oil in an onsite storage tank and recharge of the treated ground water through recharge wells; and ground water monitoring. Oil treatment will be evaluated in the second operable unit along with treatment of the source material at the site. The estimated capital cost for this remedial action is $1,960,000 with annual O&M of $190,000.

PERFORMANCE STANDARDS OR GOALS: The remedial action invokes the interim remedy waiver for contaminant-specific ARARs in ground water and surface waters; however, ground water extraction and discharge will meet MCLs. Individual MCL goals were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; MCLs; Metals; O&M; Onsite Containment; Oils; Onsite Discharge; Organics; PAHs; PCBs; RCRA; Safe Drinking Water Act; Slurry Wall; Toluene; Toxic Substances Control Act; VOCs; Wetlands.

OAK GROVE LANDFILL, MN
First Remedial Action
September 30, 1988

ROD ABSTRACT

The Oak Grove Sanitary Landfill covers 45 to 50 acres in Oak Grove Township, Anoka County, Minnesota, approximately 38 miles northwest of St. Paul. There are 249 people that live within 1 mile of the site and 6,786 reside within 4 miles. The majority of these residents depend on water from wells drawn primarily from the lower aquifer, or surface water sources. Surface runoff from the landfill empties into a wetland to the south. A creek flows through this wetland, discharging to Rum River two to three miles southwest of the site. The landfill received 200,000 to 300,000 cubic yards of waste per year from 1976 until it reached its permitted capacity in late 1983. Most of this waste consists of household trash and garbage. In addition, waste consisting of oil sludge from an oil recycling process, paint and solvent wastes, foundry wastes, metal sludges, organic compounds from pesticide manufacturing, cutting oils and lubricants, cleaning solvents, and inks are reported to have been buried near the center of the landfill but their exact location is unknown. Minnesota Pollution Control Agency (MPCA) and Anoka County records indicate a number of violations and operational problems throughout the active history of the site. MPCA discovered a ground water contamination problem from monitoring well samples obtained at the site in 1984. The primary contaminants of concern affecting ground water and surface water are VOCs including ethyl benzene, toluene and xylenes.

The selected remedial action for this site includes: installation of a security fence; capping with a final cover system consisting of a gas control layer, a barrier layer of low permeable material or a flexible membrane and a drainage layer; topsoil cover and vegetation; deed restrictions; consideration of treatment options for air emissions from gas vents after construction of the final cover; consideration during design of the need for extra protection for frost damage without significantly increasing cost or likelihood of failure; and air and ground water monitoring. The second remedial action will address the ground water contamination and possible remediation of the downgradient plume. The estimated present worth cost for this remedial action is $6,300,000 to $11,100,000 if a clay barrier is installed, or $5,500,000 to $9,300,000 if a synthetic membrane barrier is installed, with annual O&M of $42,000 or $40,000.

PERFORMANCE STANDARDS OR GOALS: This remedy addresses control of contaminant migration and risks associated with exposure to the contaminated materials, and therefore no chemical-specific standards apply.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to limit further use of the site.

KEYWORDS: Air Monitoring; ARARs; Benzene; Capping; Deed Restrictions; Water; Ground Water Monitoring; Inorganics; Landfill Closure; Metals; O&M; Organics; Public Exposure; Soil; State Criteria; Surface Water; Toluene; VOCs; Wetlands; Xylenes.

PETERSEN SAND & GRAVEL, IL
First Remedial Action - Final
September 14, 1988

ROD ABSTRACT

Petersen Sand and Gravel (PSG) is a 20-acre mining site and a former disposal area located north of Libertyville, Illinois. The site is part of a tract of land owned since 1979 by the Lake County Forest Preserve District (LCFPD). PSG is bordered by the Des Plaines River to the west, forest preserve land and residences to the east, and agricultural land and small business to the north and south. The site consists of three disposal areas including a three- to four-acre landfilled area reportedly containing construction debris, trees and tires; an area that contained 400 to 500 55-gallon drums of paint and solvent wastes; and an area that contained approximately 500 drums of solvents and 1,000 paint cans. The entire site is approximately 20 feet below the elevation of the Des Plaines River due to mining operations which are still continuing and are expected to continue until the early 1990s. LCFPD is planning to construct a recreational lake at the site when mining operations cease. Raymond Petersen purchased the property in 1952, which included a 30-acre parcel east, and a 20-acre parcel west of the river, and began the sand and gravel operations at the site later that year. Between 1955 and 1958, unknown refuse was disposed of in the four-acre landfill. In 1971 the Illinois Environmental Protection Agency (IEPA) investigated reports of illegal dumping and subsequently ordered immediate closure of the site. In 1973, the Illinois Pollution Control Board ordered complete waste removal and covering of the refuse. Additional reports cited that numerous drums were not removed. These wastes, consisting of 55-gallon drums of paint and solvent waste, were removed in 1977. An inspection conducted in 1980 detected no additional buried drums. The Lake County Grading Company (LCGC) took over the mining operations in 1983, and discovered additional buried drums of solvents and paint cans. These containers were removed from the area that year, along with contaminated soil. In 1984, the site was placed on the National Priorities List. A 20-acre area in the northwest corner of the site was the focus of concern. The final remedial investigation report conducted by IEPA was completed in April 1988, indicating no presence of contaminants at levels of concern, thus a feasibility study was not necessary. The investigation analyzed over 150 organic and inorganic compounds, and only maganese and iron exceeded secondary MCLs.

The selected remedial action for this site is no further action, since the findings in the RI indicated that previous removal actions were adequate and that no unacceptable risk remained on site. However, a lake will be constructed onsite, therefore, surface water and sediment monitoring is recommended both before and after the lake is in place. Ground water and precipitation collected in the mining pits will continue to be discharged to the Des Plaines River in compliance with the NPDES permit until the mining operations cease. There are no capital or O&M costs associated with this remedial action.

PETERSEN SAND & GRAVEL, IL
First Remedial Action - Final
Continued

PERFORMANCE STANDARDS OR GOALS: There are no performance standards applicable for this remedial action since a remedy of no further action was selected.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy; Surface Water Monitoring.

POER FARM, IN
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The 4.5-acre Poer Farm site is located about 4 miles north of Charlottesville, in Hancock County, Indiana. The site is an abandoned tract of land with a collapsed house and barn and an old, inactive well that lies southeast of the house. The surrounding area is open farmland. The nearest house is about 0.25 mile from the site and the nearby residents rely on private wells for their water supply. There are about 270 homes with a population of about 2,400 within 3 miles of the site. In 1973, approximately 260 drums of offgrade solvents and paint resins were stockpiled on the Poer property. In 1981 and 1983, the drums and an onsite well were tested and found to contain elevated levels of arsenic, cadmium, lead, and mercury. Emergency cleanup activities were conducted in the summer of 1983. All wastes were removed from the site and six to eight inches of soil were removed from the drum storage areas. Subsequent sampling showed significantly decreased levels of the heavy metals. The site was fenced and warning signs were posted. An investigation in 1988 indicated that contaminant levels were below Federal and State Health Standards and that there was no threat to human health or the environment.

The selected remedial action for this site is no further action once monitoring wells have been successfully abandoned. Previous removal actions were adequate to protect human health and the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

PRISTINE, OH
First Remedial Action - Final
December 31, 1987

ROD ABSTRACT

The Pristine, Inc. site is located in southwestern Ohio in the City of Reading (population 12,843), a suburb of Cincinnati. The site is bordered by residential and industrial areas. Three hundred feet northeast of the site is a residential trailer park. Eight municipal water supply wells serving the citizens of Reading are located approximately 300 feet northwest of the site. In 1974, Pristine, Inc. began liquid waste disposal operations at the site. Prior to 1974, the site was used for the manufacturing of sulfuric acid. In the spring of 1977, Pristine, Inc. obtained a permit to operate a liquid waste incinerator. In April 1979, as many as 8,000 to 10,000 drums and several hundred thousand gallons of bulk liquids consisting of acids, solvents, pesticides, PCBs, and other chemicals were found onsite. Disposal operations were ordered to shut down in September 1981, in accordance with a partial consent order with the State of Ohio. From June 1980 to November 1983, much of the onsite waste was removed in accordance with a Consent Decree between Pristine, Inc. and the Ohio EPA. Wastes stored, and subsequently removed, from the site during this period included paint sludges, lab packs, flammable solvents, cyanide wastes, pesticides, chlorinated solvent sludge, DDT, "neutralized" acid sludge, PCB-contaminated soils, incinerator ash, and solvent/sludge mixtures. Between March 1984 and July 1984, soil and waste removal activities addressing immediate hazardous site conditions were performed by some of the PRPs. These activities did not address the long-term risks associated with the site. The results of the RI/FS indicated that over 90 compounds were detected in the soil, ground water, surface water, and sediments including: PCE, TCE, benzene, organics, metals, pesticides and dioxin (in soils and sediments only).

The selected remedial action for this site includes: excavation and onsite consolidation on the surface of the site of 1,725 yd^3 of contaminated soils and sediments from the pit area; in-situ vitrification of 37,700 yd^3 (average of 10 feet across the entire 2.2-acre site) of contaminated soils and sediments followed by placement of a vegetative soil cover over the vitrified mass; ground water extraction and treatment using air stripping with carbon off-gas and offsite discharge to a creek; decontamination, demolition, and offsite disposal of all onsite structures in a solid waste landfill; installation of a french drain; and implementation of deed and access restrictions. The estimated present worth cost for this remedial action is $17,094,000 with annual O&M of $94,800.

PERFORMANCE STANDARDS OR GOALS: The overall health-based cleanup standard of 10^{-6} cumulative excess cancer risk at the plume boundary will be met for all media. Chemical-specific ARARs were specified for 30 contaminants based on RCRA and Safe Drinking Water Act MCLs and Clean Water Act Water Quality Criteria.

PRISTINE, OH
First Remedial Action - Final
(Continued)

INSTITUTIONAL CONTROLS: Fencing of the western boundary will limit site access and prevent exposure to contaminants present at the site. The use of deed restrictions will be considered during the remedial design.

KEYWORDS: Air Stripping; ARARs; Benzene; Carcinogenic Compounds; Clean Water Act; Debris; Decontamination; Deed Restrictions; Dioxin; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Treatment; Organics; PCE; Pesticides; Pilot Studies; RCRA; Safe Drinking Water Act; Sediments; Soil; State Criteria; Surface Water; TCE; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria.

REPUBLIC STEEL QUARRY, OH
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Republic Steel Quarry site is located in the City of Elyria in Lorain County, Ohio, southwest of Cleveland. The site is situated between West River Road and the West Branch of the Black River, directly west across the river from Franklin School. The site consists of a four-acre quarry containing water surrounded by seven acres of fenced-in property. Elyria surrounds the site, with a population of approximately 58,000. Prior to 1950, the site operated as a sandstone quarry. From 1950 to 1972, approximately 200,000 gallons of waste pickle liquor (acid wastes used in steel processing) were discharged to a ditch located on the east side of the steel plant, which flowed north into the quarry. From 1972 to 1975 the ditch was used for disposing of rinse water from pickling operations. The ditch was dammed in 1976 and after this time sulfuric acid used to pickle the steel reportedly was disposed of directly into the quarry. Heavy metals were detected in ground water downgradient from the quarry during a site investigation conducted by EPA in 1983. Further study identified low levels of numerous contaminants in the ground water. Sediments and surface water within the quarry contain VOCs and metals. Approximately 100 yd^3 of surface soil from the discharge ditch are contaminated with VOCs and metals. The primary contaminants of concern affecting surface water, sediments, and soil are VOCs including toluene, and metals including chromium and lead.

The selected remedial action for this site includes: excavation and offsite disposal in a RCRA landfill of approximately 100 yd^3 of contaminated surface soil from the pickle liquor discharge ditch and from along the southern end of the quarry; implementation of a five-year monitoring plan including a fish species survey and fish tissue bioassay to ensure absence of contaminants; and ground water monitoring. The estimated present worth cost for this remedial action is $63,200. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Waste pickle liquor is identified as RCRA waste K062, and must meet the specified land disposal restrictions BDAT levels of chromium 0.094 mg/l and lead 0.37 mg/l, as measured in TCLP extract, prior to land disposal. Treatment of the soil at this site is thought not to be needed to meet the BDAT levels but the test will be performed prior to disposal to ensure compliance.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Chromium; Excavation; Ground Water Monitoring; Inorganics; Lead; Metals; Offsite Disposal; RCRA; Sediments; Soil; Surface Water; Toluene; VOCs; Water Quality Criteria.

SOUTH ANDOVER, MN
First Remedial Action
March 30, 1988

ROD ABSTRACT

The South Andover site is comprised of several separate parcels of land totaling approximately 50 acres in the southern portion of Andover, Minnesota. One-quarter mile to the north of the site is a residential neighborhood. Further development is planned to the west and the south of the site. A large portion of the site is buried under a pile of tires and miscellaneous junk. Several smaller pieces of property on the site are auto salvage yards. The Waste Disposal Engineering landfill, a Superfund National Priorities List site, is located 3,000 feet northeast of South Andover. Multiple waste handling operations occurred between 1954 and 1981 on several properties within the site boundaries. Consequently, there are multiple source areas which include a drum storage area, a waste discharge area, and a waste burning area. In 1976, citizen complaints of well contamination prompted the Minnesota Pollution Control Agency (MPCA) to investigate the site and issue a Citation of Violation for the storage of chemical waste. Waste processing was discontinued in early 1977, and waste acceptance ceased in 1978. In 1980, the MPCA issued Notices of Violation for improper disposal of industrial wastes. In 1981, the contents of approximately 700 drums were disposed of by mixing them with waste oil and using the mixture as fuel. In 1986, a group of PRPs removed approximately 500 additional onsite drums. Soil investigations have been limited by the presence of a large volume of tires piled onsite and piles of junked automobiles. The majority of the tires are currently being shredded and removed from the site. A subsequent RI/FS for soils and the lower sand aquifer is planned following tire removal. Currently, the primary contaminants of concern affecting the ground water include: arsenic, chromium, lead, metals, VOCs, PCE, TCE, toluene, and organics.

The selected remedial action for this site includes: continuous ground water extraction and discharge to surface water with pretreatment as necessary; provision of municipal water to private well users on or near the site; ground water monitoring; and placement of restrictions on new wells on or near the site. The present worth cost for this remedial action ranges from $920,000 to $2,460,000 depending on the discharge option selected. Present worth O&M ranges from $21,000 to $140,000.

PERFORMANCE STANDARDS OR GOALS: The remedy will meet MCLs by removing the contaminated ground water in exceedance of MCLs. Individual goals include: 1,1,1-trichloroethane 200 ug/l, 1,2-dichloroethylene 70 ug/l, ethylbenzene 680 ug/l, toluene 2,000 ug/l, xylene 440 ug/l, arsenic 50 ug/l, and lead 20 ug/l. PCE and chromium will meet the State Drinking Water Limit of 6.9 ug/l and 120 ug/l, respectively. The extraction well system will operate until the completion of the subsequent RI/FS, regardless of future contaminant levels. Final cleanup levels will be established as part of the subsequent RI/FS.

SOUTH ANDOVER, MN
First Remedial Action
(Continued)

INSTITUTIONAL CONTROLS: Restrictions will be placed on new wells at or near the site.

KEYWORDS: Alternate Water Supply; ARARs; Arsenic; Chromium; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Lead; MCLs; Metals; O&M; Organics; PCE; Safe Drinking Water Act; TCE; Toluene; VOCs.

SUMMIT NATIONAL, OH
First Remedial Action - Final
June 30, 1988

ROD ABSTRACT

The 11.5-acre Summit National site is a former coal strip mine in rural Deerfield Township, Portage County, Ohio, approximately 45 miles southeast of Cleveland. In the area immediately surrounding the site there are several residences, two landfills, a cement plant, a rollerskating rink, and a used tire storage lot. There are 9 residential wells within 1,000 feet of the site. Summit National Liquid Services operated a solvent recycling and waste disposal facility on the site from 1973 to 1978. Solvents, paint sludges, phenols, cyanide, arsenic, and other liquid wastes were stored, incinerated, and buried or dumped during site operations. All onsite media are contaminated with a variety of organic and inorganic compounds, and investigations indicate that offsite areas also are affected. In addition, about 900 to 1,600 buried drums and 4 buried tanks containing hazardous substances have been identified at the site. In June 1978, EPA ordered Summit National to stop receiving waste materials and remove all liquid wastes from the site. No waste was removed before the owner sold the site in March 1979. Because hazardous chemicals were leaking into the environment, in September 1979 EPA removed three bulk tanks and their contents (approximately 7,500 gallons of hexachlorocyclopentadiene) and contaminated soil, and treated some contaminated water. Surface operations were conducted between November 1980 and June 1982, during which EPA removed drums, tanks, various surface debris, and a small amount of contaminated soil. In March 1987, EPA performed an emergency action to contain and terminate the actual or threatened release of hazardous materials due to the critically deteriorating condition of the ponds at the site. The primary contaminants of concern affecting soil, sediments, ground water, and surface water are VOCs including benzene, toluene, TCE and xylenes, other organics including phenols, PAHs and PCBs, and metals including arsenic and chromium.

The selected remedial action for this site includes: excavation and onsite incineration of approximately 32,000 yd^3 of contaminated soil and sediments and the contents of approximately 1,600 buried drums and 4 tanks, with disposal of incinerator residuals in an onsite RCRA landfill; ground water pump and treatment and onsite surface water treatment using precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon adsorption, and discharge of treated water to downgradient surface water; installation of a RCRA cap over the site, with regarding and revegetation; construction of a slurry wall around the site perimeter; dismantling and onsite disposal of all onsite structures; limited access and deed restrictions; ground water and surface water monitoring; and residence relocation. The estimated present worth cost for this action is $25,000,000 with annual O&M of $1,132,250.

SUMMIT NATIONAL, OH
First Remedial Action - Final
June 30, 1988
Continued

PERFORMANCE STANDARDS OR GOALS: Soil cleanup will attain a 2×10^{-5} cancer risk level. Discharge levels for treated ground water and surface water will meet Federal and/or State water quality standards. Individual cleanup goals for soil and ground water contaminants were not specified.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to control use of the property.

KEYWORDS: ARARs; Arsenic; Benzene; Capping; Chromium; Clean Water Act; Containment; Debris; Deed Restrictions; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Inorganics; Institutional Controls; Landfill Closure; Metals; O&M; Offsite Discharge; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Phenols; RCRA; RCRA Closure Requirements; Sediments; Slurry Wall; Soil; Solvents; State Criteria; Surface Water; TCE; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

U.S. AVIEX, MI
First Remedial Action - Final
September 7, 1988

ROD ABSTRACT

The six-acre U.S. Aviex site is located in the City of Niles, Howard Township, Cass County, Michigan. The site lies in a residental neighborhood with single family homes 100 feet to the south, east, and north. Because there are no storm or sanitary sewers nearby, surface runoff from the site and surrounding areas flows toward Bome-Huntly Drain, a tributary of St. Joseph River, and ultimately Lake Michigan. U.S. Aviex produced non-lubricating automotive fluids from the early 1960s until 1978. During operations at the plant, chlorinated hydrocarbons, including trichloroethane (TCA), were released into the vadose zone south of the process room. The subsurface soil still contains significant quantities of TCA, TCE, and PCE. In July 1972, an underground pipeline containing diethyl ether was broken during excavation near the west wall of the packaging room. Over the next several years, diethyl ether contamination was identified in downgradient residential wells southwest of the plant, approximately 0.5 mile away. U.S. Aviex installed six monitoring wells on the site beginning in 1972 and also provided alternate water supplies to homes with contaminated wells. In November 1978, a fire occurred on the site, and the large volumes of water used to extinguish the fire flushed unknown amounts of chemicals contained in barrels and tanks into the soil. Following the fire, chlorinated hydrocarbons were detected in domestic wells. Based on data developed during a ground water investigation in 1982, a purge and treatment system using air stripping and discharge to surface water was designed and installed to contain the contamination. Contaminated ground water, however, is currently flowing offsite to the southwest into residential areas. The primary contaminants of concern affecting soil and ground water are VOCs including benzene, PCE, TCA, TCE, toluene, and xylenes.

The selected remedial action for this site includes: soil flushing of approximately 11,500 yd^3 of contaminated onsite soil; and collection of onsite and offsite ground water and fluids from the soil flushing process with treatment onsite by air stripping, and discharge to surface water. The estimated present worth cost for this remedial action in $3,024,000.

PERFORMANCE STANDARDS OR GOALS: Ground water target levels are based on MCLs, proposed MCLGs, and Federal or State water quality criteria. Individual goals include benzene 5 ug/l (MCL), toluene 2,000 mg/l (PMCLG), xylenes 440 ug/l (PMCLG), PCE 0.88 ug/l (WQC), and TCE 5 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Alternate Water Supply; ARARs; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Treatment; MCLs; MCLGs; Offsite Discharge; Onsite Treatment; PCE; Plume Management; RCRA; Soil; Soil Flushing; State Criteria; TCE; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

UNITED SCRAP LEAD, OH
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The United Scrap Lead (USL) site is located in a sparsely populated area approximately one mile south of the City of Troy, Concord Township, Miami County, Ohio. The 25-acre site is bounded by two residences, one combined commercial/residential unit, and one commercial establishment. The entire USL site lies within the 100-year floodplain of the Great Miami River. From 1946 to 1980, the site was used by a lead reclamation business, reclaiming lead from used automobile batteries and selling it to lead smelters. The majority of the site is currently owned by Bailen Brothers, Inc., the successor organization to United Scrap Lead, Inc. The lead reclamation operation involved the separation of the batteries from their casings and tops, collection of the lead plates for reprocessing, and the disposal of the tops and casings onsite. The acid was originally discharged directly to an acid seepage field, but beginning in late 1972, the acid was neutralized with ammonia prior to discharge. The site first came to the attention of authorities in June 1967 when USL requested a permit to continue to dispose of the battery casings in the back portion of the property. The request was granted, but in 1972 the Ohio Department of Health required USL to implement a wastewater treatment program to fully neutralize the acid. Subsequent testing of the wastewater indicated high levels of lead, cadmium, and other toxic materials. In November 1985, the EPA Region V Emergency Response Section initiated an emergency removal action. This action removed the contaminated soil and waste materials from the immediate vicinity of the surrounding residences and placed them in a large pile onsite (approximately 55,000 yd^3). The areas of contamination at the site include the waste pile and underlying soil, contaminated site soil (approximately 45,000 yd^3), contaminated buildings, other miscellaneous wastes, approximately 100 empty drums, and several partial or intact empty chemical storage tanks. Approximately 400 yd^3 of sediment in a nearby tributary were found to contain high levels of lead and arsenic, attributed to surface runoff from the waste pile onsite. The primary contaminants of concern affecting the soil and sediments include lead and arsenic.

The selected remedial action for this site includes: excavation and onsite treatment of soil and battery casings by washing, with lead recovery and offsite disposal or recycling of casing residues and replacement of cleaned residual soil onsite; excavation and dewatering of tributary sediments followed by onsite disposal with treated soil; construction of a soil cover over disposed material and revegetation; decontamination of buildings and debris followed by offsite disposal; installation of a new residential well; imposition of minimal deed restrictions; and groundwater and surface water monitoring. The estimated present worth cost for this remedial action is $26,924,000 with estimated annual O&M costs of $55,375.

UNITED SCRAP LEAD, OH
First Remedial Action - Final
September 30, 1988
Continued

PERFORMANCE STANDARDS OR GOALS: Onsite surface soils above 500 mg/kg lead will be excavated and treated to levels which render them non-EP toxic and leave them with less than 500 mg/kg total lead. Subsurface soils which are EP toxic will be excavated and treated to levels which render them non EP-toxic. Sediment in the nearby tributary will be excavated to background lead levels (68 mg/kg).

INSTITUTIONAL CONTROLS: Minimal deed restrictions will be required, because no hazardous waste will be left onsite. However, Miami County will zone the land use.

KEYWORDS: Air Monitoring; ARARs; Arsenic; Background Levels; Debris; Decontamination; Deed Restriction; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Leachability Tests; Lead; Metals; O&M; Onsite Disposal; Onsite Treatment; Sediments; Soil; Soil Washing; Surface Water Diversion; Surface Water Monitoring; Treatment Technology; Woodlands.

VELSICOL CHEMICAL, IL
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Velsicol Chemical Corporation (VCC) is a manufacturing facility located in east-central Illinois, approximately one mile north of the City of Marshall, Clark County, Illinois. The site is bordered by a railroad on the south and by an unnamed tributary on the southwest. A total of 334 acres onsite are leased for crop farming. VCC was in operation between the mid-1930s and August 1987, and occupied an area of approximately 420 acres, 172 of which were used for production or disposal practices for petroleum derivatives including resins, solvents, and pesticides, including chlordane manufacturing. All process wastewater has been deep-well injected onsite since 1965 and the majority of the waste solids and sludges generated at the facility were disposed of in a large pond until 1980 when the firm ceased pond operations. The plant ceased operations in 1987. Accidental and intentional offsite releases of wastes were noted during the period the ponds were in operation. In the 1980s, all contaminated soil and visually contaminated sediments were consolidated and stabilized with cement and fly ash, and covered with a temporary clay cap and vegetation. The primary contaminants of concern affecting the soil, sediments, surface water and ground water are VOCs including benzene and other organics including PAHs and pesticides.

The selected remedial action for this site includes: excavation of 10,200 yd^3 of contaminated stream and pond sediments and 87,900 yd^3 of contaminated soil and backfilling with clay, and revegetation; and consolidation of all excavated material onsite in the large pond with in-place stabilization followed by construction of a RCRA cap; construction of ground water collection drain with disposal via onsite deep well injection or treatment using granular activated carbon prior to offsite discharge; ground water and surface water monitoring; and implementation of land use and deed restrictions. The estimated present worth cost for this remedial action including O&M is $9,080,910.

PERFORMANCE STANDARDS: Ground water and surface water collected from the trench system will be treated to achieve ACLs including benzene 2,000 ug/l; chlordane 0.0048 ug/l; carcinogenic PAHs 0.031 ug/l; noncarcinogenic PAHs 5.4 ug/l and phenols 100 ug/l. Soil and sediment cleanup goals will attain ACLs including benzene 2 mg/kg; chlordane 0.002 mg/kg; carcinogenic PAHs 0.010 mg/kg; non-carcinogenic PAHs 0.046 mg/kg and phenols 100 mg/kg.

INSTITUTIONAL CONTROL: Institutional controls including land use and deed restrictions will be provided until the ground water has been cleaned up to allowable levels.

VELSICOL CHEMICAL, IL
First Remedial Action - Final
September 30, 1988
Continued

KEYWORDS: ACLs; Alternate Closure; ARARs; Benzene; Capping; Clean Air Act; Clean Water Act; Containment; Deed Restriction; Direct Contact; Excavation; Filling; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachate Collection; O&M; Offsite Discharge; Onsite Containment; Onsite Disposal; Onsite Treatment; PAHs; Pesticides; Phenols; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Sediments (Stream); Soil; Solidification/Stabilization; Surface Water; VOCs; Water Quality Criteria.

WASTE DISPOSAL ENGINEERING, MN
First Remedial Action - Final
December 31, 1987

ROD ABSTRACT

The Waste Disposal Engineering (WDE) site, consisting of 73 acres of a 114-acre dump, is located in the City of Andover (formerly Grown Township), Anoka County, Minnesota. The site area is characterized by low relief with shallow water tables and numerous wetlands. During the past year, most extensive residential development has been or will be constructed and planned for around the site. The original dump was established in 1963 and operated until 1908. Disposal of wastes was by burial or burning in pits or trenches. In 1968, WDE purchased the dump and was licensed by Grow Township to operate as a sanitary landfill. In 1970, WDE submitted a solid waste permit application which included a proposal to build a specially constructed pit for hazardous waste disposal. A permit was issued in March 1971, to operate the site as a sanitary landfill. The pit received approximately 6,600 containers (ranging from one gallon pail to fifty-five gallon drums) from 1972 to 1974, in the form of acids, caustics, waste paints, spent solvents, plating sludges, and cyanides. An undetermined quantity of hazardous waste, much of it as bulk loads, was disposed throughout the landfill. Of the 3,200,000 gallons of hazardous waste thought to be disposed at the site, only ten percent is thought to have been disposed of in the pit. The area of refuse/non-hazardous waste disposal covers an area of 73 acres and contains approximately 2,500,000 yd^3 of waste. Much of the landfill is covered by lime sludge. The landfill and pit have remained abandoned and inactive since February 1984. The site property has gone through tax forfeiture so that it is currently property of the State of Minnesota with administration by the county. Currently, the pit area shows the most serious ground water degradation and is the dominant source of contaminants entering Coon Creek. The primary contaminants of concern include VOCs and organics.

The selected remedial action for this site includes: ground water pump and treatment using carbon adsorption with offsite discharge to Coon Creek; installation of a RCRA cap to completely cover the 73-acre landfill; installation of a clay slurry wall; implementation of institutional controls including well use restrictions; filling in of a wetland, construction of an alternate wetland area, and extensive monitoring; the estimated capital cost for this remedial action is $9,504,796 with present worth O&M of $862,915.

PERFORMANCE STANDARDS OR GOALS: The existing concentrations of contaminants in Coon Creek will be brought to below the 10^{-6} health-based risk level and other freshwater criteria established under the Clean Water Act. The point of compliance will be set at the landfill boundary. Safe Drinking Water Act standards are not ARAR since institutional controls will prevent use of the contaminant ground water. Also, MCLs have not been established for site contaminants.

WASTE DISPOSAL ENGINEERING, MN
First Remedial Action - Final
(Continued)

INSTITUTIONAL CONTROLS: Well use will be prohibited onsite and in adjoining areas.

KEYWORDS: ARARs; Capping; Clean Water Act; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Institutional Controls; O&M; Offsite Discharge; Onsite Treatment; Organics; Relocation; RCRA Landfill Closure; Safe Drinking Water Act; Sediments; Slurry Wall; State Criteria; Wetlands; Water Quality Criteria; VOCs.

ATCHISON/SANTA FE (CLOVIS), NM
First Remedial Action - Final
September 23, 1988

ROD ABSTRACT

The Atchison/Santa Fe (Clovis) Superfund site is located just south of the Atchison, Topeka and Santa Fe (ATSF) Railway switching yard in Clovis, New Mexico. The site is comprised of an approximately 26-acre playa lake (Santa Fe Lake) which has been owned by ATSF since the early 1900s. The surrounding area is mostly industrial, and the lake is currently fenced off to public access. The lake was used for the disposal of wastewater from various operations throughout the years. Wastewater from the washing of hopper cars used for hauling potash, cement, fertilizer, grain, and coke were disposed in the lake from 1962 to 1982. EPA and ATSF reached an agreement under an Administrative Order on Consent for ATSF to conduct an investigation of the lake area. The investigation included sampling of the lake water, the sediments at the bottom of the lake, the soils between the lake bottom and the water table, and the ground water underlying the lake. The major concern at this site is the potential threat to ground water. The aquifer that extends under the lake is the source of drinking water for the City of Clovis. Although contamination of the ground water does not pose a current threat to the city water supply, it does indicate that migration of contaminants from the lake is possible if the source of contamination is not removed. The primary contaminants of concern affecting the sediments, soil, surface water, and ground water are metals including arsenic, chromium and lead, organics including phenols and inorganics.

The selected remedial action for this site includes: construction of a run-on control dike and ditch system; evaporation of the water in Santa Fe Lake through a pump and spray sprinkler system; excavation and onsite treatment of the lake sediments through biodegradation; in situ biodegradation of contaminated soil followed by excavation and placement in the land treatment area; capping the land treatment area with a PVC liner and vegetated soil layer; grading and revegetation of the disturbed area; access restrictions; and ground water and land treatment area monitoring. Additional action may be taken to remediate ground water contamination if subsequent monitoring results indicate the need for action. The estimated present worth cost for this remedial action is $2,840,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedy is aimed at preventing contamination of the aquifer and will meet all primary State and Federal standards for drinking water.

INSTITUTIONAL CONTROLS: ATSF will be prohibited from installing drinking water wells within site boundaries.

KEYWORDS: Arsenic; ARARS; Biodegradation; Capping; Chromium; Dredging; Drinking Water Standards; Excavation; Filling; Ground Water Monitoring; Inorganics; Institutional Controls; Land Treatment; Lead; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; Phenols; RCRA; Sediments; Soil; State Criteria; Surface Water; Treatment Technology.

BAILEY WASTE DISPOSAL, TX
First Remedial Action - FINAL
June 28, 1988

ROD ABSTRACT

The Bailey Waste Disposal site is an inactive industrial waste facility located approximately 3 miles southwest of Bridge City, Orange County, Texas. The site is part of a saltwater marshland near the confluence of the Neckes River and Sabine Lake, and lies within the 100-year floodplain. The site occupies approximately 280 acres and includes two rectangular ponds, A and B, constructed by dredging the marsh and piling the sediments to form levees. The ponds were constructed in the mid-1950s as part of the Bailey Fish Camp, which operated until the 1960s. Industrial wastes, primarily organics, were disposed of along the north and east margins of Pond A during the 1950s and 1960s. Four separate areas of contamination in the vicinity of the ponds have been identified. They include: a waste channel, located north of Pond A that contains a minimum of 44,000 yd^3 of industrial waste and debris; an area east of Pond A, that contains 21,000 yd^3 of municipal and industrial waste; a drum disposal area south of Pond A, that contains fifty-eight corroded drums with an estimated volume of 80 yd^3 of industrial waste; and a series of waste pits, north of Pond A and west of the waste channel, that contains 1900 yd^3 of tar-like wastes. The primary contaminants of concern affecting the sediments include: VOCs including benzene and toluene, aromatic and chlorinated hydrocarbons, organics including PAHs, and metals.

The selected remedial action for this site includes: relocation, consolidation and treatment of contaminated sediments and wastes using a solidification technique developed during design followed by onsite disposal and capping of the residual matrix. The estimated present worth for this remedial action is $13,700,000.

PERFORMANCE STANDARDS OR GOALS: No ARARs exist at this site for contaminated soil and sediments so no chemical specific ARARs are available. The lifetime risk attained for the direct contact scenario for an adult exposed to the maximum concentration of contaminants found at the site will be 9×10^{-6} and for a child it is 1.2×10^{-5}.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Benzene; Carcinogenic Compounds; Direct Contact; Flood Plain; Metals; Onsite Treatment; Organics; PAHs; RCRA; Sediments; Soil; Solidification/Stabilization; Toluene; Treatability Studies; Treatment Technology; VOCs.

BRIO REFINING, TX
First Remedial Action - Final
March 31, 1988

ROD ABSTRACT

The 58-acre Brio Refining site is located in Harris County, Texas, approximately 20 miles southeast of Houston. The site is broken into two parcels, 49-acre Brio North and 9-acre Brio South, separated by Drive Farm Road. The site is bordered by Mud Gully, a flood control ditch that drains into Clear Creek, Dixie Oil Processors NPL site, Friendswood oil field and the Southbend residential subdivision. Between 1957 and 1982 the site refined crude oil and styrene tars to produce toluene, ethylbenzene, aromatic solvents, naphthalene, diesel fuel and kerosene. Various owners of the site stored styrene tars in 24 open pits. Other waste products and sludges were stored in aboveground tanks. Site investigation indicate that between 500,000-700,000 yd^3 of onsite soil have measurable contamination, and that high levels of VOCs exist in ground water underlying the site. Primary contaminants of concern affecting the soil and ground water are VOCs including 1,2-dichloroethane, 1,1,2-trichloroethane, and methylene chloride; and base/neutral organic compounds including phenanthrene and fluoranthene.

The selected remedial action for the Brio Refining site includes: excavation and incineration or biological treatment of all onsite soils, sludges, and liquids found to be above action levels defined in the Endangerment Assessment, with backfilling of all treated material passing the Toxicity Characteristic Leaching Procedure (TCLP). If the Brio Site Task Force (PRPs) can successfully demonstrate the effectiveness of aqueous-phase biological treatment it will be considered, otherwise, incineration will be selected; excavation and treatment of all visual onsite seeps; excavation and removal of all offsite soils contaminated above background levels; further investigation of Pit G to locate sludge or contaminated soil underlying the existing onsite wastewater treatment impoundment; consolidation and disposal of all inert debris and rubble with ultimate disposition to be determined during remedial design; disposition of Mud Gully, the flood control ditch, to be determined during remedial design; inplace stabilization of wastes existing in the wastewater treatment impoundments, backfilling with dike materials, capping, regrading and vegetating to improve runoff, and installation of a package wastewater treatment system or route wastewater to a POTW; removal and offsite disposal of tank contents, and decontamination, dismantling and selling or offsite disposal of tanks; dismantling of all onsite process equipment; monitoring ambient air; control of air emission from the treatment processes; venting waste enclosures to an emission control device; treatment of ground water in the Numerous Sand Channel Zone to a level to be determined in design; natural attenuation of the Fifty-Foot Sand Aquifer with monitoring to ensure effectiveness; regrading and vegetating areas outside excavation boundaries; construction of a stormwater transmission system draining to Mud Gully; and imposition of deed restrictions as necessary. The estimated present worth cost of this remedial action is \$23,308,000-\$23,333,000 for biological treatment or \$22,458,000-\$26,598,000 for incineration based on 62,900 yd^3 of treatable material.

BRIO REFINING, TX
First Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: Media above Endangerment Assessment action levels will be treated to target levels based on a 10^{-6} incremental cancer risk for carcinogens and on an acceptable chronic daily intake for non-carcinogens. Individual action and target levels were not specified. Offsite soil contamination above unspecified background levels will be removed. Ground water in the channel will be treated to a level determined during design. Since the ground water may never be used as a ground water source, immediate application of MCLs is not appropriate.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented as needed.

KEYWORDS: Air Monitoring; ARARs; Capping; Clean Water Act; Consolidation; Debris; Decontamination; Deed Restrictions; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Institutional Controls; MCLs; O&M; Offsite Disposal; Onsite Treatment; Organics; Publicly Owned Treatment Works; Sludge; Soil; Stabilization; State Criteria; Treatment Technology; Venting; VOCs; Water Quality Criteria.

DIXIE OIL, TX
First Remedial Action
March 31, 1988

ROD ABSTRACT

The 26.6-acre Dixie Oil Processors (DOP) site is located in Harris County, Texas, approximately 20 miles southeast of Houston. The site is broken into two parcels, 19-acre DOP North and 7.6-acre DOP South, separated by Dixie Farm Road. The site is bordered by Mud Gully, a flood control ditch that flows into Clear Creek, Friendswood Oil Field, the Brio Oil Refining NPL site, and various athletic fields. Between 1969 and 1978, the DOP North parcel operated as a copper recovery and hydrocarbon washing facility. Six surface impoundments were used to store copper wastewater and wastewater from the hydrocarbon washing operation prior to recovery and treatment. In 1977 the impoundments were closed and decommissioned and the property sold to DOP. In 1978, DOP began operations on the South parcel of the site. These activities included the following: regeneration of cuprous chloride catalyst; hydrocarbon washing to produce ethylbenzene, toluene, aromatic solvents and styrene pitch; oil recovery; and blending and distilling chemical residues to produce fuel oil, creosote extender and molybdenum concentrate catalyst. The North parcel was not used in these operations. All site activities ceased in 1986. Wastes were disposed of onsite in tanks, drums, and waste pits. Sampling indicates contamination of surface and subsurface soils and shallow ground water. The primary contaminants of concern affecting soil and ground water are ethylbenzene, hexachlorobenzene, copper, 1,1,2-trichloroethane and methylene chloride.

The selected remedial action for the Dixie Oil Processors site is a limited action alternative consisting of: site controls including, but not limited to, fencing and deed restrictions to prevent site access; excavation and removal of contaminated offsite soils to background levels, the extent of removal to be determined during remedial design; consolidation and disposal of onsite debris and rubble, disposal method to be determined during design; remediation of Mud Gully, details to be determined during design; operation of the existing wastewater treatment system during implementation of remedial action, then dismantling and removal upon completion; removal and disposal of tank contents and drums, and dismantling, decontamination, and either selling or offsite disposal of tanks; dismantling and disposal of all process equipment; ambient air sampling; control of air emissions from treatment processes, if necessary; sampling and monitoring of Mud Gully sediments and ground water to determine effectiveness of remedy; and regrading and vegetation of the entire DOP site. The estimated present worth costs of this remedy is $241,000.

PERFORMANCE STANDARDS OR GOALS: Excavation of offsite contaminated soil to background levels.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent site access and development.

KEYWORDS: Air Monitoring; ARARs; Clean Water Act; Consolidation; Debris; Decontamination; Deed Restrictions; Excavation; Ground Water; Ground Water Monitoring; Institutional Controls; Metals; O&M; Offsite Disposal; Organics; Publically Owned Treatment Works; RCRA; Soil; State Criteria; VOCs; Water Quality Criteria.

FRENCH LIMITED, TX
First Remedial Action - Final
March 24, 1988

ROD ABSTRACT

The French Limited, Inc. (FLI) site, a 22.5-acre tract of land, is located in Harris County, Texas. The site is situated one mile east of the San Jacinto River. The entire site is within the 100-year flood plain of the River and has flooded frequently in the past. Between 1966 and 1972, approximately 300,000 yd^3 of industrial wastes from area petrochemical companies were deposited in an unlined 7.3-acre pit, formerly an active sand pit. The disposal site operated under a temporary permit issued by the Texas Water Quality Board. In 1973, the permit was revoked after extensive public hearings and legal proceedings, and FLI was ordered to cease operations. As part of the settlement, FLI was ordered to remove all the structures, tankage, and process equipment. The tract of land was ultimately deeded to the State. During a flood event, the dike surrounding the waste pit was overtopped and breached, and contaminated sludges were discharged into an adjacent slough. In 1982, the U.S. EPA conducted an immediate Removal Action (IRA). The dike was repaired and the majority of discharged sludges were pumped back into the pit. The floating portion of the sludges was removed and disposed of in July 1983 during another U.S. EPA IRA. Ground water has been heavily contaminated by the leaching action of organic wastes deposited in the pit. Sludge and soil from the waste pit and adjacent slough include the following primary contaminants: PCBs, PCP, organics, VOCs, metals, and arsenic.

The selected remedial action for this site includes: in-situ biodegradation of sludges and contaminated soils with aeration of the lagoon waste for degradation enhancement; stabilization of residues followed by onsite disposal; ground water pump and treatment; surface water discharge to the San Jacinto River with treatment, as necessary; backfilling of the lagoon to grade and contour; and ground water monitoring. The estimated present worth for this remedial action is $47,000,000.

PERFORMANCE STANDARDS OR GOALS: Ground water recovery and treatment will continue until modeling shows that a reduction in the concentration of VOCs to a level which attains the 10^{-6} human health criteria can be achieved through natural attenuation in ten years or less. Additionally, remediation will be consistent with TSCA regulations and policy for cleanup of PCBs and PCB contaminated material, Water Quality Criteria for ground water and surface water, including criteria established in the SDWA and its MCLs. Individual cleanup goals were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Arsenic; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Flood Plain; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; Offsite Discharge; Onsite Treatment; O&M; Organics; PAHs; PCBs; RCRA; Safe Drinking Water Act; Sludge; Soil; Toxic Substances Control Act; Treatment Technology; VOCs; Water Quality Criteria.

GURLEY PIT, AR
Second Remedial Action - Final
September 26, 1988

ROD ABSTRACT

The Gurley Pit site consists of a 3.25-acre pit located approximately one mile north of Edmondson, Crittenden County, Arkansas. The site lies within the 100-year flood plain of Fifteen Mile Bayou, which discharges to the Mississippi River. Land in the vicinity of the site is sparsely populated with five residences located within a 0.5 mile radius. The primary land use is agricultural. Gurley Refining Company (GRC) leased the site from R.A. Caldwell between 1970 and 1980. During this time the pit was divided by levees into three cells and used between 1970 and 1975 as a state permitted disposal site for secondary oil refining wastes including acids, oil sludges, PCBs, inorganics and spent diatomaceous wastes. In March 1975, citizen complaints regarding discharges from the pit led to investigations by the Arkansas Department of Pollution Control and Ecology (ADPCE), which discovered permit and State environmental statute violations by GRC. GRC abandoned the site in 1976. In May 1978, EPA and ADPCE received complaints of chronic overflows from storm runoff. These overflows had an adverse affect on fish and waterfowl in the Fifteen Mile Bayou. Subsequently, EPA conducted separate spill cleanup operations in July 1978 and April 1979. EPA completed an Enforcement Decision Document (EDD) in October 1986, which addressed the source control operable unit consisting of the waste in the pits and the surface contamination. The selected source control remedy included treatment and discharge of onsite surface water, offsite incineration of PCB-contaminated oil, ground water monitoring, and stabilization and onsite disposal of contaminated sludge, sediment, and soil. This ROD addresses the ground water operable unit. Investigations have determined that contaminants from the pit have not migrated through the subsurface into the ground water. Elevated levels of inorganics (specifically arsenic and manganese) were detected but were consistent with background levels. No site-related contaminants were identified in the ground water.

The selected remedial action for this site is no further action beyond that already specified in the source control operable unit EDD. The ground water will be monitored for at least thirty years to ensure that no migration of the contaminants occurs. There are no Federal capital or O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Concentrations of metals (e.g., arsenic, iron and manganese) that exceeded MCLs in ground water were not attributable to the pit contaminants but exist in elevated levels naturally, therefore, ground water cleanup levels are not applicable for this site.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Flood Plain; Ground Water Monitoring; No Action Remedy.

INDUSTRIAL WASTE CONTROL, AR
First Remedial Action - FINAL
June 28, 1988

ROD ABSTRACT

The 8-acre Industrial Waste Control (IWC) site, an abandoned coal strip mine, is a closed industrial waste landfill about 8 miles southeast of Fort Smith near Jenny Lind, Sebastian County, Arkansas. Landfilling operations began in the late 1960s or early 1970s and primarily dealt with municipal refuse and debris, and industrial trash. In August 1974, the site was purchased by Grady Shipley and granted an industrial landfill permit by the Arkansas Department of Pollution and Ecology. The site received a wide variety of liquid wastes (including methylene chloride, phenols, cresylic acid, and paints), solid wastes, and sludges. In addition, the site possibly contains about 9,000 buried drums. In March 1977, surface impoundments overflowed and contaminated a local pond and pastures north of the site resulting in a fish kill in the pond and the death of several cattle. Consequently, the site was covered, recontoured, and closed by the State in 1978. Land use around the site primarily consists of pasture land and low density residential areas. Although no residences within a one-half mile radius north of the site depend on private wells for drinking water, several local wells are still used for watering lawns and livestock, a fish pond, and occassionally for domestic uses when the municipal supply is not functional. Four areas of contamination have been identified at the site. Area A is the deepest portion of the strip mine which ran along the entire northern portion of the site, and includes drums containing solidified wastes typically of dried paint and solidified foam. Area B lies south of the strip mine and includes shale spoils from surface mining and random crushed drums. Area C is located in the center of the site and contains two former surface impoundments constructed in 1975 and used as evaporation ponds for bulk liquids. Shale spoils, crushed used drums, landfill debris, and sludge-like sediments were also found in Area C. Area D, located in the extreme southwest corner south of Area B, contains intact, liquid-filled and crushed drums as well as contaminated shale spoil. Approximately 19,500 cubic yards of contaminated soil is located in Area C and D. The primary contaminants of concern affecting the soils, sediments, ground water and surface water include: VOCs including toluene, organics, and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes: installation of a french drain along the south, west and east sides of the site with a synthetic liner or other barrier, such as a slurry wall installed on the site side of the french drain; excavation of Area D liquid-filled drums with offsite disposal; excavation and onsite stabilization of Areas C and D soil with onsite disposal of residual matrix in the Area C excavation pit; categorization of solid and liquid wastes resulting from previous investigations with disposal consistent with Area C and D materials; ground water pump for offsite treatment, mixture with the contaminated soil and stabilized onsite, or treatment in an onsite facility with discharge to be determined during design; multilayer RCRA capping to cover the area bound by the french drain system and the northern site border; surface water diversion using ditches and berms; access and land use restrictions; and ground water and site monitoring. The estimated present worth cost for this remedial action is $11,400,000.

INDUSTRIAL WASTE CONTROL, AR
First Remedial Action - FINAL
(Continued)

PERFORMANCE STANDARDS OR GOALS: The stabilized matrix will pass the RCRA Toxicity Characteristic Leaching Procedure and/or other EPA-approved leachate test as well as the ASTM strength test. Ground water plant discharge and effluent limitations will be established by EPA and ADPCE. MCLs for arsenic, cadmium, chromium, lead, and TCE are relevant and appropriate ground water cleanup standards; however, the quantitative MCL goals were not specified.

INSTITUTIONAL CONTROLS: Land use restrictions will be implemented to maintain the integrity of the Remedial Action and to prevent further onsite development.

KEYWORDS: ARARs; Arsenic; Capping; Chromium; Clean Water Act; Containment; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Lead; MCLs; Metals; Offsite Discharge; Offsite Treatment; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Sediments; Slurry Wall; Soil; Solidification/Stabilization; State Criteria; Surface Water Diversion; TCE; Toluene; Treatment Technology; VOCs; Water Quality Criteria.

KOPPERS TEXARKANA, TX
First Remedial Action
September 23, 1988

ROD ABSTRACT

The Koppers Texarkana site is located within the City of Texarkana, Texas. The site consists of a 34-acre residential area and a 28-acre former sand and gravel operation. The site is bordered by the Texas and Pacific Railroad to the north, an unnamed creek to the northwest, Wagner Creek to the southwest, Jameson Street to the south, and a drainage ditch to the southwest. The entire site is within a 100-year flood plain. The Koppers Company operated the site as a wood preserving facility from 1910 to 1961, using pentachlorophenol (PCP), creosote, and metallic salts in the operation. The facility consisted of an operations area, a drip track, and treated and untreated wood storage areas. The site is currently owned by Carver Terrace, Inc., which built a subdivision of 79 single-family homes on a portion of the site, and the Kennedy Sand and Gravel Company, which mined sand and gravel on their parcel from 1975 to 1984. Two other owners of small portions of the site are the Mount Zion Missionary Baptist Church and Jesse and Otha Pace. The Texas Department of Water Resources (TDWR) became aware of the site in 1979 through the Ekhardt Survey. The sand and gravel pit was fenced off, and in 1985 EPA covered 24 residential lots with soil and sod to protect the residents while the RI/FS was conducted by Koppers under an Administrative Order on Consent. The RI indicated that the highest concentration of site contaminants in the soil were located near the operations and drip track areas of the old wood preserving facility. In addition, the highest concentrations in the ground water were noted in or near pockets of non-aqueous phase liquids (NAPLs) also in these site areas. The primary contaminants of concern affecting the soil, ground water and sediments are VOCs including benzene, xylenes, and toluene, other organics including PAHs and PCP, and metals including arsenic.

The selected remedial action for this site includes: excavation of approximately 3,300-19,400 yd^3 of soil from residential yards where CPAH levels exceed 100 mg/kg, with backfilling using clean soil, landscaping disturbed yards, and onsite treatment of the soil using soil washing with disposal in the Kennedy Sand and Gravel pit or an offsite hazardous waste disposal facility; temporary relocation of sensitive residents (if necessary); collection of NAPLs via trenches in the Kennedy Sand and Gravel pit and/or via a well nest in Carver Terrace and treatment at an onsite waste water treatment plant using oil/water separation followed by activated carbon or fluidized carbon bed treatment with recycling or offsite incineration of recovered NAPLs and reinjection of treated ground water into the aquifer; ground water monitoring; excavation and treatment of drainage ditch sediments in the soil washing unit; and deed and access restrictions. The estimated present worth cost for this remedial action is $6,400,000, which includes annual O&M costs of $300,000.

KOPPERS TEXARKANA, TX
First Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: The cleanup goal for contaminated soil is 100 mg/kg carcinogenic PAHs, corresponding to a risk factor of 3 x 10^{-5}. The ground water levels of free phase creosote will be remediated to a level of nondetection.

INSTITUTIONAL CONTROLS: Deed notices will be imposed for the Kennedy Sand and Gravel property.

KEYWORDS: Air Monitoring; ARARs; Arsenic; Benzene; Carcinogenic Compounds; Deed Restriction; Direct Contact; Excavation; Filling; Flood Plain; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Metals; O&M; Oils; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; RCRA; Relocation; Sediments; Soil; Soil Washing; State Criteria; Toluene; Treatability Studies; Treatment Technology; VOCs; Xylenes.

NORTH CAVALCADE STREET, TX
First Remedial Action - Final
June 28, 1988

ROD ABSTRACT

The 21-acre North Cavalcade Street site is located in northeast Houston, Texas. The surrounding areas are a mixture of residential, commercial, and industrial properties. Surface water is drained by three stormwater drainage ditches, one of which flows into Hunting Bayou, a limited aquatic habitat as classified by Texas Water Quality Standards. The site was developed in 1946 when Houston Creosoting Company, Inc. (HCCI) established creosote wood preserving operations. Around 1955, HCCI added pentachlorophenol (PCP) wood preservation services and other support facilities. Wood preserving operations ceased in 1961, and the property was sold in 1964. Subsequent property owners divided the site into smaller tracts and sold them to a succession of owners. There has been no industrial activity at this site since 1964. Between September 1985 and November 1987, EPA sampled all environmental media and found PAHs, VOCs, and components of creosote in soil, ground water, and sediments. The area of soil contamination corresponds to where creosote was historically stored, and the point of entry for the contaminants into the ground water. The plume of contamination currently covers approximately 4 acres. Creosote components were found in drainage ditch sediments probably as a result of rainfall runoff during the time of historical operations. The primary contaminants of concerning affecting the ground water, soils, and sediments include: VOCs, benzene, toluene, xylene, and PAHs.

The selected remedial action for this site includes: biological treatment of 22,300 yd^3 of soil (in situ is preferred, however, the optimum method will be determined after pilot testing); ground water pump and treatment of 5,600,000 gallons using oil/water separation and carbon adsorption with re-injection into the aquifer or, if necessary to maintain the water balance, discharge into an onsite drainage ditch which discharges into Hunting Bayou; and offsite incineration of all non-aqueous phase liquids (NAPLs) separated out from the ground water. The estimated present worth cost for this remedial action is $4,210,000. There is no O&M associated with this remedy.

PERFORMANCE STANDARDS OR GOALS: Soil and ground water cleanup will attain a cumulative 10^{-5} cancer risk level. Individual soil cleanup goals include PAHs 1 mg/kg, and benzene 0.04 mg/kg. Individual goals for ground water include: benzene 5 ug/l (MCL), toluene 2,000 ug/l, and xylene 440 ug/l. Additionally, ground water will be treated until all NAPHs are completely removed.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Benzene; Carcinogenic Compounds; Clean Water Act; Direct Contact; Ground Water; Ground Water Treatment; MCLs; Offsite Treatment; Onsite Discharge; Onsite Treatment; PAHs; Pilot Testing; RCRA; Safe Drinking Water Act; Sediments; Soil; Toluene; Treatment Technology; VOCs; Water Quality Criteria.

ODESSA CHROMIUM I, TX
Second Remedial Action - Final
March 18, 1988

ROD ABSTRACT

The Odessa Chromium I site consists of a series of chromium-contaminated wells within 300 acres of residential, commercial, and industrial properties and facilities immediately west of West County Road, just outside the northwestern city limits of Odessa, Ector County, Texas. Nearly every residence or commercial facility is served by one or more water wells completed in the underlying Trinity Aquifer, which offers the only source of potable ground water. Two potential sources of ground water contamination at the site have been identified: 4318 Brazos property, and 2104 West 42nd Street. In December 1979, the Texas Department of Water Resources identified the 4318 Brazos property as a potential source of chromium contamination. Several chrome plating operations functioned at this property between 1972 and 1977. The site at 2104 West 42nd Street is presently operating as a metal plating facility. This property was first identified as a possible source of ground water contamination in 1978. The first operable unit ROD, signed in September 1986, provided for the extension of the city's water supply until final ground water remediation is complete. Although chromium is the primary contaminant of concern affecting the ground water, other inorganics have been found in the soil.

The selected remedial action for this site includes: demolition and disposal of a building at 4318 Brazos; ground water pump and treatment using electrochemical techniques with reinjection into the Trinity Aquifer; and ground water monitoring. The estimated present worth cost for this remedial action is $2,836,000.

PERFORMANCE STANDARDS OR GOALS: The EPA Primary Drinking Water Standard for chromium 0.05 mg/l was used as the basis for the target concentration. This MCL standard is currently under review by EPA. Should the standard be revised prior to implementing the design phase of the project, the revised standard will become the target concentration. The risk associated with the ingestion of chromium in the soil approaches the 10^{-6} risk level therefore, soil remediation is not considered necessary.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Chromium; Clean Water Act; Debris; Direct Contact; Drinking Water Standards; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; MCLs; O&M; Onsite Discharge; Onsite Treatment; Safe Drinking Water Act; Sole-Source Aquifer; Treatability Studies.

ODESSA CHROMIUM II, TX
Second Remedial Action - Final
March 18, 1988

ROD ABSTRACT

The Odessa Chromium II site consists of a series of chromium-contaminated wells within 200 acres of residential, commercial, and industrial properties and facilities just outside the northwestern city limits of Odessa, Ector County, Texas. Nearly every residence or commercial facility is served by one or more water wells completed in the underlying Trinity Aquifer, which offers the only source of potable ground water. Two separate contaminant plumes are bounded by the site: 5329 Andrews Highway, and 57th Street and Andrews Highway. In 1970, local health department authorities investigated a complaint of contaminated (5.5 mg/l chromium) well water on the property to the south of 5329 Andrews Highway. At that time, wastewater analysis did not indicate the presence of chromium, but in 1978, a cleaning vat solution, which was eventually stored in partially buried steel tanks, contained 2.8 mg/l of chromium. One of the storage tanks was discovered leaking and the tanks were subsequently removed. The facility at 57th Street and Andrews Highway has been in operation since about 1950. Chromates were utilized in the cooling system until about 1976. This system was apparently tied into one of the plant's water wells and during occasional slow downs, cooling water could have been inadvertently back flushed into the well since there was no check valve. The plant also utilized an unlined pit for the disposal of contaminated wastewater, including chromate wastes from the cooling water system, until about 1977. The first operable unit, signed in September 1986, provided for the extension of the city's water supply until final ground water remediation is complete. Although chromium is the primary contaminant of concern to the ground water, other inorganics have been found in the soil.

The selected remedial action for this site includes: ground water pump and treatment using electrochemical techniques with reinjection into the Trinity Aquifer; and ground water monitoring. A treatability study will be conducted during the system design phase of the project to aid in designing an appropriate treatment system. The estimated present worth cost for this remedial action is $3,618,000.

PERFORMANCE STANDARDS OR GOALS: The EPA Primary Drinking Water Standard for chromium 0.05 mg/l was used as the basis for the target concentration. This MCL standard is currently under review by EPA. Should the standard be revised prior to implementing the design phase of the project, the revised standard will become the target concentration. The risk associated with the ingestion of chromium in the soil approaches the 10^{-6} risk level therefore, soil remediation is not considered necessary.

INSTITUTIONAL CONTROLS: Not applicable.

ODESSA CHROMIUM II, TX
Second Remedial Action - Final
(Continued)

KEYWORDS: ARARs; Chromium; Clean Water Act; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; MCLs; O&M; Onsite Discharge; Onsite Treatment; Safe Drinking Water Act; Sole-Source Aquifer; Treatability Studies.

OLD MIDLAND PRODUCTS, AR
First Remedial Action - Final
March 24, 1988

ROD ABSTRACT

The Old Midland Products site is an abandoned creosote and pentachlorophenol wood preserving plant and sawmill, located in Ola, Yell County, Arkansas. The site is flat with a total area of approximately 37 acres. Between 1969 and 1970, Old Midland Products was in operation treating wood with creosote. Effluents from the treatment process containing PCP and polynuclear aromatic compounds were discharged into lagoons via a moveable discharge pipe. Pond overflows of minor consequence have occurred with drainage to the intermittent stream west of the lagoons. The land, originally owned by the Old Midland Products Company, was sold in 1979 to the Plainview - Ola Economic Trust Inc. Approximately 9,000 to 21,000 yd^3 of soil, 850 yd^3 of drainage sediments, 450,000 gallons of ground water, 620,000 gallons of lagoon fluids, and 2,770 yd^3 of lagoon sludges are contaminated with PCP and polynuclear aromatic hydrocarbons.

The selected remedial action for this site includes: onsite thermal destruction of the contaminated surface soils, lagoon sludges, and drainageway sediments with onsite disposal of waste residuals and a vegetated cover; and ground water pump and treatment using carbon adsorption, possibly with biodegradation pretreatment. The estimated cost for this remedial action is $12,000,000.

PERFORMANCE STANDARDS OR GOALS: The cleanup level for total pentachlorophenol (PCP) contained in soil, sludges, and sediments is 1 mg/kg. Ground water cleanup will attain a 10^{-5} cancer risk level.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Granular Activated Carbon; Ground Water; Ground Water Treatment; PCP; PAHs; Sediments; Sludges; Soil; Treatment Technology.

SAND SPRINGS, OK
Second Remedial Action
June 28, 1988

ROD ABSTRACT

The 235-acre Sand Springs Petrochemical site, located in Sand Springs, Oklahoma, is a former refinery and solvent recycling facility that operated between 1900 and the early 1970s. The site is located immediately west of Tulsa along the northern bank of the Arkansas River and consists of unlined acid sludge pits, a surface impoundment, solvent and waste oil lagoons and several subsurface sludge pits and spray ponds. During plant operations, waste products were disposed of in the unlined pits, surface impoundments and spray ponds. Primary contaminants of concern affecting the soils, shallow ground water, and sediments were organic solvents and heavy metals. In September, 1987, a source control Record of Decision was signed to control and destroy the major sources of contamination. This second Record of Decision deals with the remainder of the site, primarily shallow ground water and minimally contaminated soil.

The selected remedial action for the remainder of the Sand Springs site is no further action. Based upon the findings of the RI/FS, the Endangerment Assessment for the operable unit concluded that no significant risk to public health or the environment exists. Ground water and the Arkansas River water will be monitored for 30 years after completion of the source control remedial action, and warning signs and fences will be erected as part of this no action alternative. Estimated capital cost of the remedy is $9,300 with annual O&M costs of $45,600.

PERFORMANCE STANDARDS OR GOALS: The ROD did not specify individual goals; however, nearby residential wells have not been affected and should not become affected based on the direction of ground water flow, which is towards the river. In a worst case scenario, discharge from the site to the river would be 4.6 times less than NPDES regulatory standards.

INSTITUTIONAL CONTROLS: Site access restrictions will be implemented.

KEYWORDS: ARARs; Ground Water; Ground Water Monitoring; Institutional Controls; Metals; No Action Remedy; Surface Water Monitoring; VOCs.

SOL LYNN, TX
First Remedial Action
March 25, 1988

ROD ABSTRACT

The 0.75 acre Sol Lynn site, also known as the Industrial Transformers site, is located in Houston, Texas. The area around the site is a mix of residential, commercial, and light industrial facilities. Approximately 2,000 residents and 100,000 other people move within a one-mile radius of the site on a daily basis due to recreational activities associated with the area. The site operated as an electrical transformer salvage and recycling company between 1971 and 1978, and as a chemical recycling and supply company from 1979 through 1980. The first documented investigation of this site took place during the fall of 1971 when the City of Houston Water Pollution Control Division noted that workers at Industrial Transformers poured oil out of electrical transformers onto the ground during transformer dismantling. In 1981, strong odors originating from the site were brought to the attention of the Texas Department of Water Resources, the predecessor agency of the Texas Water Commission (TWC). Upon inspection, approximately 75 drums were found scattered about the property. Most of the drums, labeled "trichloroethylene", were empty and had puncture holes. A technical assessment of the site, commencing in January 1986, indicated the presence of PCB contamination. PCB contamination has been confined to the top two feet of soil. The highest concentrations of PCBs were found in the middle of the site. TCE has migrated deeper than the PCBs and away from the site. Residual TCE remaining in the surface soil will be remediated along with the PCB contaminated soils. Any TCE that has migrated into the deeper ground water will be addressed in the subsequent remedial action. The primary contaminants of concern affecting the soil are PCBs.

The selected remedial action for this site includes: excavation of approximately 2,400 yd^3 of PCB-contaminated soil and treatment using alkali metal polyethylene glycolate (APEG) complex dechlorination with onsite disposal of treatment residuals; effectiveness verification of the dechlorination process through treatability studies; and pretreatment of liquid by-products, if necessary, with discharge into a publicly owned treatment works facility. The estimated present worth cost for this remedial action is $2,200,000.

PERFORMANCE STANDARDS OR GOALS: Soil will be treated at or below the health-based criterion for PCB-contaminated soils of 25 mg/kg based on the Toxic Substances Control Act Spill Cleanup Policy.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Direct Contact; Excavation; Onsite Treatment; PCBs; Publicly Owned Treatment Works; RCRA; Soil; State Criteria; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs.

SOL LYNN, TX
Second Remedial Action - Final
September 23, 1988

ROD ABSTRACT

The 0.75 acre Sol Lynn site, also known as the Industrial Transformers site is located in Houston, Texas. The area around the site is a mix of residential, commercial, and light industrial development. The residential population in the area is approximately 2,000, and a maximum daily traffic of 100,000 persons may move within a one-mile radius due to recreational activities. The site was used for electrical transformer salvage and recycling between 1971 and 1978, and for chemical recycling and supply from 1979 through 1980. An investigation during late 1971 by the Houston Water Pollution Control Division revealed that workers at the site poured oil out of electrical transformers onto the ground during transformer dismantling. In 1981, strong odors originating from the site prompted further investigation, which found approximately 75 drums scattered about the property. Most of the drums, labeled "trichloroethylene," were empty and had puncture holes. In 1986, the site was divided into operable units to address soil and ground water contamination. A previous ROD addressed onsite contaminated soil. This ROD addresses contaminated ground water in the class IIB aquifer directly below the site. The primary contaminant of concern affecting the ground water is TCE.

The selected remedial action for this site includes: ground water pump and treatment of approximately 12 million gallons using air stripping, with discharge to a POTW or reinjection into the water-bearing zone. The estimated present worth cost for the remedial action is $2,204,890. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Ground water treatment will meet the MCL for TCE of 5 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Discharge; Onsite Treatment; Safe Drinking Water Act; TCE; Treatability Studies; VOCs.

SOUTH CAVALCADE, TX
First Remedial Action - Final
September 26, 1988

ROD ABSTRACT

The 66-acre South Calvacade site is located in northeast Houston, Texas. The surrounding areas are a mixture of residential, commercial, and industrial properties. Stormwater runoff flows to two stormwater drainage ditches, which flow into Hunting Bayou, a limited aquatic habitat as classified by Texas Water Quality Standards. The site was used as a wood preserving and coal tar distillation facility from 1910 to 1962. The wood preserving facility consisted of an operations area, a drip track, and treated and untreated wood storage areas. The operations area included wood-treating cylinders, chemical storage tanks, and a waste water lagoon. Creosote and metallic salts were used in the operation. Subsequently, the site was sold, divided into smaller tracts, and resold to the current owners. The site is currently used by three commercial trucking companies, which have erected four buildings on the northern and southern parts of the site. In 1983, the Houston Metropolitan Transit Authority investigated the site for potential mass transit use and found evidence of buried creosote. Beginning in November 1985, EPA sampled all environmental media and found two discrete areas of contamination at the site corresponding to the former locations of the wood treating operations and coal tar plant in the southern portion of the site, and a pond previously existing in the northern portion of the site. PAHs, VOCs, metals and components of creosote were detected in the soil, sediments, and ground water. The primary contaminants of concern affecting the ground water, soils, and sediments are VOCs including benzene, toluene, and xylenes, other organics including PAHs, and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes: excavation and onsite washing of 19,500 yd^3 of soil, replacing the soil in the excavated areas and capping, and treating wash water in the ground water treatment system; in situ soil flushing of 10,500 yd^3 of soil; ground water pump and treatment of 50,000,000 gallons using physical/chemical separation, pressure filtration, and carbon adsorption with re-injection into the aquifer or, if necessary, discharge to the onsite drainage ditch which flows into Hunting Bayou; offsite incineration or recycling of all non-aqueous phase liquids separated out from the ground water; and ground water monitoring. Alternatively, in situ biological treatment of soil and ground water will be considered if a potentially responsible party can demonstrate its equivalent or superior performance and implementability costs. The estimated present worth cost for this remedial action is $13,000,000.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup will attain a cumulative 10^{-5} cancer risk level. Individual soil cleanup goals include CPAHs 700 mg/kg and no leaching potential (which may require removal of total PAHs above 150 mg/kg). Ground water cleanup will attain a cumulative 10^{-4} cancer risk level. Individual goals for ground water include: CPAHs no detection, benzene 5 ug/l (MCL), toluene 28 ug/l (MCL), xylene 440 ug/l (MCL), and arsenic, chromium and lead 50 ug/l (MCLs).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to control land use.

KEYWORDS: ARARs; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Containment; Deed Restrictions; Direct Contact; Excavation; Filling; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; Lead; MCLs; Metals; Offsite Disposal; Offsite Treatment; O&M; Onsite Discharge; Onsite Treatment; Organics; PAHs; RCRA; Safe Drinking Water Act; Sediments; Soil; Soil Washing/Flushing; State Criteria; State Permit; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

SOUTH VALLEY/EDMUNDS STREET, NM
Second Remedial Action
June 28, 1988

ROD ABSTRACT

The South Valley/Edmunds Street site is a large area in the southern part of the City of Albuquerque, New Mexico, surrounding the municipal water well known as San Jose 6. Within this large area are a number of industrial properties owned and operated by different groups and individuals. This remedial action addresses the Edmunds Street Ground Water operable unit of the South Valley site; the Edmunds Street property is located in the southeastern corner of the site. The focus of this operable unit is the area around the monitoring well SV-10, referred to as the drainage pit area, on the Edmunds Street property. This area is the low spot of the property and receives much of the property drainage. Analyses of this area have shown significant levels of industrial solvents in the soil, and a plume of contaminated ground water starting at the drainage pit area and extending to the east. The ground water source will be treated as a sole-source aquifer because there are no alternate sources available to the City of Albuquerque. The contaminated ground water currently poses a direct threat to Albuquerque's water supply by moving toward the city's well fields. The primary contaminants of concern affecting the ground water include VOCs such as PCE and TCE.

The selected remedial action for this site includes: ground water pump and treatment using air stripping (packed tower aeration) with reinjection of the treated water into the aquifer through infiltration galleries; and ground water and air monitoring. The present worth cost for this remedial action is $874,000, with present worth O&M costs estimated at $280,200.

PERFORMANCE STANDARDS OR GOALS: The contaminated ground water will be treated to a PCE level of 20 ug/l as required by the New Mexico Water Quality Control Commission regulations, and to the MCL for TCE of 5 ug/l as required by the Safe Drinking Water Act.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Air Stripping; Containment; Extraction; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Onsite Discharge; Onsite Treatment; PCE; Plume Management; Safe Drinking Water Act; Sole-Source Aquifer; State Criteria; TCE; Treatment Technology; VOCs.

SOUTH VALLEY/SJ-6, NM
Third Remedial Action
September 30, 1988

ROD ABSTRACT

The South Valley/SJ-6 site is located on the southern margin of Albuquerque, New Mexico, just north of South Valley. The total site encompasses the SJ-6 municipal well, and six industrial facilities and their surrounding properties within an approximately one square mile radius. Land use is primarily industrial and agricultural with residential areas located immediately north of the site. Industrial development began in the South Valley area just prior to the 1940s. Metal parts were manufactured in the area starting around 1948. By the 1960s, organic chemicals were being handled and packaged on the site. Currently, petroleum fuels and various chlorinated organics are stored, handled and used within the South Valley areas. Ground water contamination was first suspected in 1978 when foul tastes and odors were noted in ground water from a private well on the Edmunds property in South Valley. Subsequent sampling revealed the presence of several VOCs in three municipal wells including SJ-6. One of the wells was resampled in 1988 and found to be free of contaminants, another well was taken out of service because of mechanical problems, and SJ-6 was shut down in 1980 due to the continual detection of low levels of solvents. This ROD addresses only the source and extent of ground water contamination in the vicinity of SJ-6. Principle threats at the site (i.e., the source and emanating plumes of contamination from surrounding areas) are being addressed through remedial actions initiated by EPA in separate RODs. The primary contaminants of concern affecting the ground water are VOCS including 1,1-DCE, PCE and TCE.

The selected remedial action for this site includes: removal and disposal of 100 yd^3 of contaminated sediments at the base of the SJ-6 borehole; sealing abandoned wells; ground water monitoring; and access restrictions. The estimated present worth cost for this remedial action is $4,000,000 with estimated annual O&M of $300,000.

PERFORMANCE STANDARDS OR GOALS: All risks to human health will be eliminated by the removal and disposal of sediments at the base of the SJ-6 borehole which appear to be the source of contamination. Remediation on adjacent sites as well as source control at this site will reduce plume concentrations to below state health criteria within five years. Federal health criteria are already being attained.

INSTITUTIONAL CONTROLS: Restrictions will be implemented to ensure that wells are constructed using techniques that prevent cross-contamination of zones and are deep enough to prevent exposure to contaminants.

KEYWORDS: ARARs; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; O&M; PCE; Safe Drinking Water Act; State Criteria; TCE; VOCs.

SOUTH VALLEY/PL-83, NM
Fourth Remedial Action
September 30, 1988

ROD ABSTRACT

The Former Air Force Plant 83/General Electric Operable Unit (PL-83) is a portion of the South Valley Superfund site in Albuquerque, New Mexico. The South Valley Superfund site is an area surrounding the City of Albuquerque Municipal Water Well known as San Jose No. 6. The General Electric (GE) property is located in the western portion of the site. The South Valley site is situated in an industrial area, but there are residences immediately north of the GE property. The GE property has been the site of manufacturing operations since 1948 when the Eidal Manufacturing Company had a welding operation onsite. In 1951 the Atomic Energy Commission, through American Car Foundry, took over the property and conducted machining of metal parts, plating, welding, and other activities. This continued until 1967 when the Air Force took over the property and converted the plant into an aircraft engine manufacturing plant operated by General Electric. The plant was sold to General Electric in 1983, and currently produces aircraft engine parts. The contaminants which caused the listing of the South Valley site on the NPL consisted mainly of industrial solvents. Investigations into the GE property were conducted in 1984, 1985, 1987, and 1988 by the Air Force under a Memorandum of Understanding with EPA. The GE property is heavily built up, with the majority of the site paved or covered with buildings. As a military contracting facility, access to the plant is tightly controlled and there is no regular access other than by employees. Three areas of contamination have been identified at the site: four hazardous waste storage areas which were used for chemical storage, the north parking lot (a former dirt parking lot which was sprayed with oil as a dust control measure), and the DWB-2 area which contains methylene chloride and freon contamination. The volume of contaminated soils is estimated to be 36,000 yd^3. In addition to soil contamination, ground water contamination occurs at depths of up to 160 feet. The primary contaminants of concern affecting the ground water and soil are VOCs including PCE, and metals.

The selected remedial action for this site includes: installation of soil vapor extraction wells; extraction of soil vapor under vacuum; decontamination of effluent air through a carbon adsorption system; further sampling and definition of soil contamination; installation of ground water extraction wells in both the shallow aquifer and the deeper zone; treatment of extracted ground water with air stripping followed by carbon adsorption and reinjection of treated water into the aquifers (chemical or physical treatment of ground water will occur where metal concentrations exceed background or ARARs); and further definition of ground water contamination through installation and sampling of additional monitoring wells. The estimated present worth cost for soil remediation is $1,820,000. No figures are given in the ROD for the ground water remedial action.

PERFORMANCE STANDARDS OR GOALS: Soils treatment will continue until the vapor extraction system ceases to produce volatile contaminants. Water extraction will continue until the levels of contaminants in the water fall below State and Federal regulatory standards. Individual contaminant goals were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Carcinogenic Compounds; Drinking Water Contaminants; Drinking Water Standards; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; Onsite Treatment; Organics; PCE; Public Exposure; Safe Drinking Water Act; Soil; State Criteria; Treatment Technology; Vacuum Extraction; VOCs.

STEWCO, TX
First Remedial Action - Final
September 16, 1988

ROD ABSTRACT

The Stewco site, previously a tanker truck terminal and truck washing facility, is located in northeastern Texas, in Eastern Harrison County, south of the city limits of Waskom. The site consists of two nonadjacent locations approximately one mile apart, referred to as Location 1 and Location 2. Location 1 is a one-half acre plot that includes a maintenance shop with fueling facilities, a truck-tank washing facility, and two backfilled and capped evaporation ponds (ponds 1 and 2) that received wastewater from the tank washing operation. Approximately 50 homes are located within one-half mile of Location 1, four of these are within 500 feet of the north, west and south site boundaries. In addition, shallow wells are located approximately one mile to the north. Location 2 consists of a third pond which received excess wastewater conveyed by truck from the evaporation ponds at Location 1. Approximately 30 homes are within a one-half mile radius of Location 2. Land use within a one mile radius of the two locations includes residential, recreation, industrial, and commercial. The underlying Wilcox aquifer serves the city of Waskom as well as numerous domestic users within a three mile radius of the site. From 1972 - 1979, R.A. Corbett Transport, Inc. owned, operated and maintained a fleet of transport trucks engaged in contract hauling for the oil and gas industry and various businesses. Stewco purchased the site in 1979 and continued operations until declaring bankruptcy in 1983. Materials hauled included glue, resin, gasoline, diesel, jet fuel, and creosote. The wastewater generated from washing the outside of trucks, and the tank residue resulting from steam cleaning the inside of the tankers were directed to pond 1 with overflow entering pond 2, and the surplus transported to the third pond at Location 2. All ponds were unlined. Reports from the Texas Water Commission files indicate numerous instances of noncompliance with permit requirements. After abandonment in 1983, ponds 1 and 2 began to overflow their dikes creating a serious threat of dike collapse and significant hazardous substances release. Consequently, EPA conducted a removal action at Location 1 from March 31 to April 14, 1984. The action consisted of removing the source of contamination: 400,000 gallons of liquid wastes were pumped, treated, and discharged; and 5,500 yd^3 of sludges from the bottom and sides of the disposal ponds were stabilized and disposed of offsite. The pond disposal area was then backfilled and capped. No removal or remedial actions were taken at Location 2 since the level of contamination was much less than that of Location 1 and the pond was not filled near capacity. The contaminants of concern prior to the removal action were VOCs, PAHs, and phthalates.

EPA determined that, based on the effectiveness of the previous removal action, the residual contamination remaining in the soil, pond sediments, and ground water poses no threat to public health, and that no long-term

STEWCO, TX
First Remedial Action - Final
(Continued)

monitoring is necessary. Therefore, no further action will be taken at this site. However, ground water contamination has been identified that is not attributed to the site. Follow-up actions by the State and EPA will attempt to determine the source of this contamination. If within 2 years of the signing of this ROD, wells onsite at Stewco are determined to be of no use to the offsite source investigation, closure will be initiated. The cost of plugging the 16 wells is estimated not to exceed $5,000.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific goals met by this no action remedy were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

UNITED NUCLEAR CORPORATION, NM
First Remedial Action
September 30, 1988

ROD ABSTRACT

The United Nuclear Corporation (UNC) site is located approximately 17 miles northeast of Gallup, New Mexico, in McKinley County. The site operated as a State-licensed uranium mill facility from June 1977 to May 1982. It includes an ore processing mill (about 25 acres) and an unlined tailings pond area (about 100 acres). The surrounding area is sparsely populated, with the nearest residence located 1.5 miles from the site. In July 1979, approximately 23 million gallons of tailings and pond water were released to a nearby river as a result of a dam breach in the tailings pond area. The site damage was repaired; however, attention was focused on ground water contamination resulting from tailings seepage. Consequently, UNC implemented a ground water pumping system that withdrew ground water from the aquifers underlying the site and sent it to an onsite borrow pit for evaporation. UNC also conducted tailings neutralization from late 1979 to early 1982. Nevertheless, the offsite migration of radionuclides and chemical constituents from uranium milling byproduct materials into the ground water, as well as to surface water and air, are still principal threats at the site. This remedial action will address onsite ground water contamination. Source control and onsite surface reclamation will be implemented under the direction of the Nuclear Regulatory Commission and integrated with this ground water operable unit. The primary contaminants of concern affecting the ground water are metals including arsenic, and radioactive substances including radium-226/228 and gross alpha.

The selected remedial action for this site includes: implementation of a ground water monitoring program to detect any increases in the areal extent or concentration of ground water contamination outside the tailings disposal area; ground water pump and treatment using existing and/or new extraction wells to control and remove tailings seepage and remediate contaminated ground water, with discharge to an enhanced mister/pond evaporation system; and implementation of a performance monitoring and evaluation program. The estimated present worth cost for this remedial action is $17,000,000 over a 10-year period, with estimated annual O&M of $1,000,000.

PERFORMANCE STANDARDS OR GOALS: Contaminant concentrations in ground water will attain MCLs or New Mexico Water Quality Act standards (or background levels where these are higher). Individual cleanup goals include arsenic 50 ug/l (MCL), cadmium 10 ug/l (MCL), cobalt 50 ug/l (NMWQA), radium-226/228 5 pCi/L (MCL), selenium 10 ug/l (MCL), and gross alpha 15 pCi/L (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Arsenic; Background Levels; Direct Contact; Drinking Water Standards; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; MCLs; Metals; Mining Wastes; O&M; Plume Management; Radioactive Materials; Safe Drinking Water Act; State Criteria.

ARKANSAS CITY DUMP, KS
First Remedial Action
September 29, 1988

ROD ABSTRACT

The 200-acre Arkansas City Dump site is located in the southwest section of Arkansas City, Cowley County, Kansas, and is bounded on the west and south by a levee that separates it from the Arkansas River. The site falls within the 100-year floodplain and includes a north waste area and a south waste area, both located in the central portion. Land use adjacent to the site is a mixture of crop and rangeland, and commercial and residential. Urban areas exist to the north and east of the site with residential areas bordering on the north and mixed residential and commercial areas on the east. Approximately 60 residences are adjacent to the eastern boundary, and several businesses that employ about 100 to 150 people are located onsite. Ground water flows predominantly to either the southwest or southeast toward the Arkansas River due to a ground water divide that exists near the center of the site. Upgradient ground water is used for drinking purposes by Arkansas City as well as private residences. Downgradient, east and southeast of the site, private wells are used to provide water primarily for lawn and garden watering. The site was used as an oil refinery between 1916 and the mid-1920s. Residual acid sludge from the distillation process was disposed of in pits or on the ground predominantly in the north waste area. Subsequently, 160 acres were used as a municipal landfill, referred to as the Arkansas City Landfill. For over 50 years, alkaline sludge from Arkansas City's water treatment plant as well as municipal refuse and solid wastes were disposed into lime-sludge ponds located in the south waste area. Investigations conducted since 1980 by the Kansas Department of Health and Environment have determined that all media are contaminated with various organics and inorganics primarily from refining wastes. This contamination is a result of 1,300,000 ft^3 of acid sludge and between 500,000 to 1,000,000 gallons of residual oil product which has mixed with the subsurface soil predominantly between the north and south waste areas. The principal contributor of organic contaminants to the ground water, particularly polynuclear aromatic hydrocarbons (PAHs), appears to be the soil contaminated sediments in the subsurface. However, contaminants are not migrating offsite. This Record of Decision (ROD) addresses remediation of acid sludge in the north waste area; a subsequent ROD will address the oil-contaminated sediments and ground water contamination. The primary contaminants of concern in the acid sludge are organics including PAHs, and sulfuric acid.

The selected remedial action for the north waste area operable unit includes: in situ neutralization of the acid sludge followed by the installation of a soil cover; completion of a supplemental feasibility study addressing remedial alternatives for the subsequent operable unit; institutional controls including deed restrictions; and ground water monitoring.

PERFORMANCE STANDARDS OR GOALS: Neutralization of acid sludge will attain a pH less than 2.0 and eliminate the potential for sulfur dioxide emissions.

ARKANSAS CITY DUMP, KS
First Remedial Action
(Continued)

INSTITUTIONAL CONTROLS: Deed restrictions and other institutional controls will be implemented to prohibit soil excavation and construction of buildings on any part of the site still containing hazardous materials and to ensure that drinking water supply wells are not drilled into contaminated parts of the aquifer.

KEYWORDS: Acids; Alternate Closure; ARARs; Clean Air Act; Clean Water Act; Containment; Deed Restrictions; Direct Contact; Flood Plain; Ground Water Monitoring; Institutional Controls; O&M; Onsite Containment; Onsite Treatment; Organics; PAHs; RCRA; Safe Drinking Water Act; Sludge; Solidification/Stabilization; State Criteria; Treatment Technology.

BIG RIVER SAND, KS
First Remedial Action - Final
June 28, 1988

ROD ABSTRACT

The Big River Sand (BRS) site is located one-half mile west of the Arkansas River and adjacent to the Wichita Valley Center Floodway, in Sedwick County, Kansas. The site consists of approximately 123 acres, half of which has been extensively mined for sand and gravel. Sand and gravel mining is still active on the property. During the early 1970s, approximately 2,000 drums of paint-related waste were disposed of on the eastern portion of the site, adjacent to a five-acre sand quarry lake. In 1978, 80 acres of the site containing the drum storage area and quarry lake were sold to BRS. In 1982, as a condition of the sales agreement, the drums were moved to an unsold portion of the site. Nearly 200 drums were transferred before the Kansas Department of Health and Environment (KDHE) halted the action because the area was not permitted to store or dispose of the waste. KDHE conducted the initial site inspection in August 1982 and identified damaged, corroded, and leaking drums. Paint sludges were determined to be EP-toxic for chromium, and waste solvents and paint sludges from several drums contained metals and VOCs. Waste solvents from the barrels were determined to be hazardous due to their ignitability. A PRP was ordered by KDHE in September 1982 to conduct a removal and site cleanup. These occurred between 1982 and 1984. Sampling by KDHE between 1982 and 1985 detected arsenic, lead, and selenium in drinking water wells, and VOCs, including toluene, in onsite soils and in monitoring wells.

It has been determined that the site does not pose a significant threat to public health, welfare, and the environment. Therefore, no further action has been selected as the preferred alternative. The estimated future cost, if sampling is conducted in year five, is $5,800.

PERFORMANCE STANDARDS OR GOALS: Metals and VOCs in the soil and ground water are not outside the range of metals and VOCs found naturally occurring in soil and ground water. Additionally, no MCLs are being exceeded in onsite or offsite drinking water wells.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Arsenic; Flood Plain; Ground Water; Ground Water Monitoring; Inorganics; MCLs; Metals; No Action Remedy; Safe Drinking Water Act; Soil; Toluene; VOCs.

CHEROKEE COUNTY/GALENA, KS
First Remedial Action
December 21, 1987

ROD ABSTRACT

The Cherokee County site, the Kansas portion of the Tri-State Mining District, is located in the extreme southeastern corner of Kansas. The Galena subsite, one of six subsites identified within the Cherokee County site, encompasses 18 square miles. The Galena subsite is characterized by surface mining waste features that impact the quality of the shallow ground water aquifer. This aquifer is a primary source of drinking water for approximately 1,050 people. Remains from past mining activity at the subsite include: large areas covered by mine and mill wastes, water-filled subsidence craters, and open mine shafts. EPA investigations of the Galena subsite conducted in 1986 and 1987 demonstrated that the shallow ground water aquifer and surface water are contaminated with elevated concentrations of metals. Due to the concern for the health of persons drinking this water, EPA Region VII conducted a removal action and installed water treatment units on these wells. This removal action was considered a temporary protective measure. The primary contaminants of concern observed in the private wells include: cadmium, lead, selenium, and zinc.

The selected remedial action for this site provides for collection of water from the aquifer through existing wells owned by the City of Galena with subsequent distribution of that water through a pipeline network to 418 houses, businesses, and farms outside of the Galena municipal water system but within the subsite. Additional capacity for the expanded system will be rehabilitated. If rehabilition becomes infeasible due to unforeseen onsite technicalities, a new deep aquifer well may be drilled to provide additional water. The remedy includes acquiring the construction and equipment necessary to setup a water supply to this area. The estimated present worth cost for this remedy is $5,300,000 with annual O&M of $100,000.

PERFORMANCE STANDARDS OR GOALS: Extracted ground water will be chlorinated prior to discharge and will meet the MCLs for cadmium 10 ug/l, lead 50 ug/l, selenium 10 ug/l, and zinc 5,000 ug/l.

INSTITUTIONAL CONTROLS: Existing institutional controls on municipal water supply systems are considered adequate.

KEYWORDS: Alternate Water Supply; ARARs; Cadmium; Clean Water Act; Drinking Water Contaminants; Inorganics; Interim Remedy; Ground Water; Lead; MCLs; Metals; O&M; Safe Drinking Water Act; State Criteria.

JOHN DEERE DUBUQUE WORKS, IA
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The John Deere Dubuque Works site is located approximately 2.5 miles north of the City of Dubuque, Iowa. The site is owned by Deere and Company, which has operated a manufacturing plant at the site since 1946. The plant property includes an area of 1,447 acres located in the flood plain at the confluence of the Little Maquoketa River and the Mississippi River. The waste management history of the plant is complex, but the primary area of concern is an unlined landfill originally placed in a natural depression caused by the Little Maquoketa River. Prior to 1968, wastes were placed in the low areas of the landfill and combustible materials were burned. Wastes included caustics (sodium or potassium hydroxide), acids (hydrochloric or sulfuric), petroleum distillates (solvents, grinding oils, and so forth), heavy metals (chromium, lead, zinc), cyanide, and paint sludges. Another area of concern at the facility is the site of a 1980, 200,000-gallon diesel fuel spill. A diesel fuel recovery system involving an oil/water separator for non-aqueous phase liquids (NAPLs) was implemented that same year. Investigations conducted by John Deere indicated that human health hazards at the landfill could be considered minimal with the primary hazard being the possibility of dissolved organic chemicals impacting offsite domestic wells located east of the plant along the Mississippi River. Maintaining a minimum pumping rate of 1.2 mgd in the plant production wells will create sufficient drawdown to prevent migration of contaminated ground water to the offsite wells. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, and toluene.

The selected remedial action for this site includes: development of an alternate potable water supply for the plant; extraction and offsite discharge of water from the contaminated alluvial aquifer using the existing production wells to maintain drawdown around the plant and landfill areas; continuation of extraction and treatment of NAPLs from production well No. 3 with offsite discharge of treated ground water and offsite disposal of collected NAPLs; imposition of deed restrictions to prevent inappropriate use of the plant property in the future; and development of a contingency plan to ensure that contaminants do not migrate offsite in the event of a plant shutdown (which would result in the loss of drawdown from production wells). The estimated present worth cost for this remedial action is $5,151,800 with annual O&M costs of $276,600.

PERFORMANCE STANDARDS OR GOALS: Recovery operations will continue until ground water quality meets Federal primary drinking water standards (MCLs) and EPA Health Advisories, and until the maximum recoverable amount of NAPL is withdrawn. Individual contaminant goals were not specified.

JOHN DEERE DUBUQUE WORKS, IA
First Remedial Action - Final
(Continued)

INSTITUTIONAL CONTROLS: Deed restrictions will be imposed to ensure that future use of the current plant property will be limited to industrial activities only and that water wells tapping the alluvial aquifer beneath the property will not be allowed.

KEYWORDS: Alternate Water Supply; ARARs; Benzene; Carcinogenic Compounds; Consent Decree; Deed Restriction; Flood Plain; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Offsite Discharge; Offsite Disposal; O&M; Onsite Treatment; Organics; PCE; Public Exposure; Safe Drinking Water Act; Solvents; State Criteria; TCE; Toluene; VOCs; Water Quality Criteria.

FULBRIGHT/SAC RIVER LANDFILLS, MO
First Remedial Action - Final
September 30, 1988

ROD ABSTRACT

The Fulbright and Sac River Landfills are located just north of the City of Springfield, Missouri, in a semirural area. The site is in the flood plain of the Little Sac River, and is owned by the City of Springfield, along with much of the surrounding land. Adjacent land use includes a police shooting range, an animal shelter (dog pound), and an inactive wastewater treatment plant. The landfills were operated by the city for the disposal of municipal and industrial solid wastes. The Fulbright Landfill covered 98 acres and operated from 1962 through 1968. The Sac River Landfill, formerly known as the Murray Landfill, covered 114 acres and was in operation from 1968 through 1974. Generally, wastes (drummed or bulk) were disposed of in trenches and covered with soil. The City of Springfield and Litton Industries Inc. agreed to conduct the RI and the FS under the oversight of EPA. Several leachate seeps have been noted, especially during wet weather. In addition to the landfill areas, another source of contamination was identified where a few dozen drums and waste residues were disposed of in a sinkhole on the bluff above the Fulbright Landfill. Based on data from the RI, environmental contaminant concentrations in soil, ground water, leachate, surface water, and sediments do not exceed applicable or relevant and appropriate requirement standards. The site, however, could endanger human health or the environment in the future through exposure of the industrial wastes through erosion of the landfill cover, installation of drinking water wells at or near the landfills, or from direct contact with leachate at the seeps. While a reference is made to disposal of cyanide and acid wastes, the primary contaminants of concern affecting the media investigated are not listed in the ROD.

The selected remedial action for this site includes: removal of the drum and drum remnants found in the sinkhole and associated trench east of the Fulbright Landfill; sampling the removed contents to determine hazardous characteristics; proper offsite treatment or disposal of removed contents; observation of the leachate seeps during maintenance (no action), ground and surface water monitoring for a 30-year maintenance period; and imposition of deed restrictions and ground water use prohibitions. The estimated present worth cost for this remedial action is $270,400 if wastes are disposed of as hazardous waste or $246,600 if disposed of as solid waste.

PERFORMANCE STANDARDS OR GOALS: Individual contaminant goals were not specified.

INSTITUTIONAL CONTROLS: Deed restrictions will be imposed on the city property containing the landfills.

KEYWORDS: Acids; ARARs; Debris; Deed Restriction; Direct Contact; Excavation; Flood Plain; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Municipally-Owned Site; O&M; Offsite Disposal; Public Exposure; Sediments; Soil; Surface Water; Surface Water Monitoring.

HASTINGS GROUND WATER/COLORADO AVENUE, NE
First Remedial Action
September 28, 1988

ROD ABSTRACT

The Colorado Avenue subsite of the Hastings Ground Water Contamination site is located in the City of Hastings, Adams County, Nebraska. The Colorado Avenue subsite is a part of the Central Industrial Area which contains commercial and industrial properties situated along the Burlington-Northern railroad right-of-way. Residential properties are located immediately south and east of the site. Hastings industries used TCE at the site during the early to mid-1960s. From 1967 to May 1982 the site was used by Dravo Corporation for manufacturing of heating and air conditioning equipment. Metals were cleaned prior to finishing with a vapor-degreasing process, and waste solvents were discharged directly into the sanitary sewer and the storm sewer. The site has since been acquired by Marshalltown Instruments Company, who claims to have no involvement with disposal of the chemical contaminants. Ground water contamination was discovered when an out-of-service drinking water well was put back in service in 1983, resulting in complaints about the water quality. Subsequently, the Nebraska Department of Health and the Nebraska Department of Environmental Control began investigating widespread ground water contamination in the Hastings area. Active Hastings municipal water wells are located within one block, 3,000 feet, and 4,500 feet of the site, all three accessing a sole source aquifer. The highest levels of contamination of soil and soil-gas occur along the sanitary and storm sewers at the site, with localized areas which correspond to joints in the sewers. The volume of contaminated soil is estimated to be 42,700 yd^3 yards and is the focus of this ROD. High levels of the contaminants are also found in the ground water beneath the site. The primary contaminants of concern affecting soil and ground water are VOCs including TCE and PCE.

The selected remedial action for this site includes: in situ soil vapor extraction, utilizing vacuum extraction technologies; treatment of extracted vapor with an activated carbon system, if necessary; and implementation of an O&M program which includes soil, air and ground water monitoring. Results of the ground water monitoring will be used to develop a technical approach for plume management and evaluate the need for ground water treatment in a subsequent ROD. The estimated present worth cost for this remedial action is $3,603,000, which includes a projection of annual O&M costs for the five year operating period. Long term O&M costs will depend on the success of the vapor extraction during the operating period.

PERFORMANCE STANDARDS OR GOALS: The initial source control effort is designed to control contaminant migration to the aquifer, therefore, no cleanup levels are established. Cleanup effectiveness will be evaluated based on volumes of contaminants recovered from the soil.

INSTITUTIONAL CONTROLS: Not applicable.

HASTINGS GROUND WATER/COLORADO AVENUE, NE
First Remedial Action
(Continued)

KEYWORDS: Air Monitoring; ARARs; Carcinogenic Compounds; Clean Air Act; Drinking Water Contaminants; Granular Activated Carbon; Ground Water Monitoring; Interim Remedy; O&M; Onsite Treatment; Organics; PCE; Public Exposure; Soil; Sole-Source Aquifer; Solvents; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs.

HASTINGS GROUND WATER/FAR-MAR-CO, NE
First Remedial Action
September 30, 1988

ROD ABSTRACT

The FAR-MAR-CO subsite of the Hastings Ground Water site is located east of the City of Hastings, Adams County, Nebraska. The subsite is a part of an industrial enterprise zone which contains industrial properties situated along the Burlington-Northern railroad right-of-way. Residential properties are located immediately northwest of the site and agricultural lands are located east of the site. Historical and current use of the area has been for grain storage and railcar loading. The site is currently owned by Farmland Industries, Inc., who acquired the property through a merger with FAR-MAR-CO, Inc. in 1967. The current and previous owners used various chemicals onsite for fumigation of stored grain. Contamination was discovered when complaints about water quality were received by the Nebraska Department of Health (NDOH). Subsequently, the NDOH and the Nebraska Department of Environmental Control began investigating widespread ground water contamination in the Hastings area. Wells that are part of CMS, Inc. public supply system are located east and downgradient of the subsite. Contaminated soil at the subsite are believed to be the result of accidental spills and may be the direct result of a 1959 grain dust explosion which damaged a fumigation tank system, releasing 997 gallons of fumigant. The highest levels of contamination of soil and soil-gas occur in relatively small zones near the original grain elevator and adjacent to a large liquid fumigant bulk storage tank. The volume of contaminated soil is estimated to be 33,800 yd^3 yards and is the focus of this ROD. High levels of the contaminants are also found in the ground water beneath the site. The primary contaminants of concern affecting soil and ground water are carbon tetrachloride and ethylene dibromide (EDB).

The selected remedial action for this site includes: in situ soil vapor extraction, utilizing vacuum extraction technologies; treatment of extracted vapor with an activated carbon system, if necessary; access restrictions; and implementation of an O&M program which includes soil, air and ground water monitoring. Results of the ground water monitoring will be used to develop a technical approach for plume management and evaluate the need for ground water treatment in a subsequent ROD. The estimated present worth cost for this remedial action is $2,526,000, which includes a projection of annual O&M costs for the five year operating period. Long-term O&M costs will depend on the success of the vapor extraction during the operating period.

PERFORMANCE STANDARDS OR GOALS: This initial source control effort is designed to control contaminant migration to the aquifer, therefore no cleanup levels are established. Cleanup effectiveness will be evaluated based on volumes of contaminants recovered from the soil.

INSTITUTIONAL CONTROLS: Not applicable.

HASTINGS GROUND WATER/FAR-MAR-CO, NE
First Remedial Action
(Continued)

KEYWORDS: Air Monitoring; ARARs; Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Contaminants; Granular Activated Carbon; Ground Water Monitoring; Interim Remedy; O&M; Onsite Treatment; Organics; Pesticides; Public Exposure; Soil; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs.

MIDWEST MANUFACTURING/NORTH FARM, IA
First Remedial Action
September 30, 1988

ROD ABSTRACT

This Record of Decision addresses the North Farm operable unit, which is one of two subsites of the Midwest Manufacturing site and is located in a rural area approximately two miles north and one-half mile east of Kellogg, Jasper County, Iowa. Approximately 600 people live in Kellogg. Land use near the site is mainly agricultural, with pasture land on and around the site. The closest residence to the North Farm subsite is approximately one mile from the site. The subsite consists of an unlined disposal cell containing approximately 200 yd^3 of soil contaminated with electroplating wastes. The disposal cell is located on the lower slope of a rolling hill adjacent to the valley of Bear Creek, which is an intermittent stream located 500 feet east of the site. Bear Creek lies 50 feet lower than the site. Records indicate that electroplating activities took place at this site prior to 1979 and ceased operations in June 1981 Activities involved the use of various heavy metals, including cadmium, nickel, and zinc, as well as cyanide. In 1977, a wastewater treatment plant was installed at the facility to treat the plant effluent before it was discharged into the North Skunk River. Solids generated at the treatment plant were temporarily stored in a tank onsite and periodically transferred to the disposal cell. The disposal cell was unlined and had no soil cap, leachate collection system or run-on and run-off controls. Soil sampling was conducted onsite and downslope of the site in 1982 and 1983 to evaluate the potential for offsite contaminant migration due to previous waste disposal practices. Analysis of the samples revealed that soil contamination had occurred via surface run-off. The primary contaminants of concern affecting the soil are cadmium and cyanide.

The selected remedial action for this operable unit includes: excavation of cadmium-contaminated soil within and around the disposal cell with either onsite or offsite soil treatment including stabilization, and offsite disposal of the treated soil at a permitted RCRA Subtitle C disposal facility; and backfilling and grading of the excavated area with clean soil to support a vegetative cover. The estimated total present worth cost for this remediation is $140,000 - $170,000. The remedial action for the Midwest Manufacturing operable unit of this site will be addressed in a subsequent ROD.

PERFORMANCE STANDARDS OR GOALS: Contaminated soil will be excavated to less than the health-based action level of 13 mg/kg for cadmium. Treated soil will meet the treatment standards specified in the Land Disposal Restrictions for F006 nonwastewaters and will be measured as a leachate contaminant concentration using the TCLP. The treatment standards are cadmium 0.066 mg/L, total chromium 5.2 mg/L, lead 0.51 mg/L, nickel 0.32 mg/L, and silver 0.072 mg/L.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Clean Closure; Direct Contact; Excavation; Filling; Inorganics; Leachability Tests; Metals; Offsite Disposal; Onsite Treatment; RCRA; RCRA Closure Requirements; Soil; Solidification/Stabilization; Treatment Technology.

MINKER/STOUT/ROMAINE CREEK, MO
Second Remedial Action
September 29, 1988

ROD ABSTRACT

The Minker/Stout/Romaine Creek (M/S/RC) site is located in the city of Imperial, Jefferson County, Missouri, 25 miles southwest of St. Louis. The site is an unincorporated, wooded residential area and is comprised of four noncontiguous areas: Minker, Stout, Cashel, and Sullins. It is within a distance of approximately 0.8 miles and includes the upper 6000 feet of Romaine Creek. Contamination at the site resulted from the use of dioxin-contaminated soil as fill material, and has spread as a result of erosion from these areas. Contaminated soil in all areas except the Stout area and Romaine Creek has been excavated and currently is stored in interim onsite storage. The total volume of contaminated soil at this site including the amount in temporary storage is estimated to be 12,000 cubic yards. The primary contaminant of concern affecting the soil at this site is 2,3,7,8-TCDD (dioxin).

The selected remedial action for this site includes: excavation of soil exceeding 20 ppb dioxin and offsite thermal treatment and incinerator ash disposal at the Times Beach site; placing of clean soil cover and revegetation over all areas with residual dioxin levels between 1 and 20 ppb; and offsite thermal treatment and incinerator ash disposal at the Times Beach site of contaminated soil held in interim storage. The estimated total capital cost for this remedial action is $48,800,000, which includes all costs from the Times Beach site.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels will attain a 1 ppb dioxin level at the ground surface and a 5 to 10 ppb dioxin level at a depth of one foot or greater. Thermal treatment will attain six-nines destruction and removal efficiency of dioxin from soil.

INSTITUTIONAL CONTROLS: Institutional controls will be established to control future land use and to prevent future residential development.

KEYWORDS: ARARs; Carcinogenic Compounds; Dioxin; Direct Contact; Excavation; Flood Plain; Incineration; Ingestion; Inhalation; Institutional Controls; O&M; Offsite Disposal; Offsite Treatment; Public Exposure; RCRA; Relocation; Soil; State Criteria; Temporary Onsite Storage; Thermal Treatment; Treatment Technology.

SHENANDOAH STABLES, MO
First Remedial Action
July 28, 1988

ROD ABSTRACT

The Shenandoah Stables (SS) site is located in a rural area near Moscow Mills, Lincoln County, Missouri, approximately 35 miles northwest of St. Louis, Missouri. The property includes an enclosed arena and horse stables. There are about 8 residences located within a 0.5 mile radius of the site, as well as a livestock operation, and other small businesses on approximately 5- to 10-acre parcels around the facility. The site lies in the upper flood plain of Crooked Creek. In May 1971, the area inside the arena was sprayed with dioxin-contaminated waste oil for dust control purposes. There are reports that 1,500 gallons of waste material were applied at this time. Following this spraying, a number of adverse effects were noted; horses and other animals became ill or died, and the six-year-old daughter of one of the owners was hospitalized for a variety of symptoms assumed to be related to exposure to contaminated soil. Between August 1971 and March 1972, approximately 24 to 26 inches of the contaminated material was removed and disposed of either offsite or onsite in two removal episodes. Investigations were conducted by EPA in May 1982, which indicated continued exterior and interior contamination of the facility by dioxin at levels greater than 1,750 ug/kg. Since the spraying, the site has been flooded a number of times, with water levels inside the arena as high as four feet above the arena floor. Investigations have shown contamination of approximately 8,600 yd^2 of interior and exterior site areas. The primary contaminant of concern affecting the soil and structures at the site is dioxin.

The selected remedial action for this site includes: excavation of all dioxin-contaminated surface soil exceeding 1 ug/kg with continued excavation until a residual concentration of 5 to 10 ug/kg at the 2 to 4-foot depth is reached in the arena and slough, or excavation until bedrock is encountered, with backfilling of excavated area, placement of the excavated soil in lined polypropylene bags, and storage of the bags in RCRA-equivalent enclosed steel storage structures onsite; and decontamination of onsite structures. Approximately 3,300 yd^3 of soil are expected to be excavated and stored. The estimated present worth cost for this remedial action is $3,936,500.

PERFORMANCE STANDARDS OR GOALS: Excavation of surface soil exceeding 1 ug/kg dioxin, and 5 to 10 ug/kg at a 2-foot depth in the arena or 1-foot depth in other areas, to a maximum 4-foot depth or to bedrock based on health-based action levels provided by ATSDR.

INSTITUTIONAL CONTROLS: The arena and stables are to be closed and access to the property will be restricted.

KEYWORDS: ARARs; Debris; Dioxin; Direct Contact; Excavation; Flood Plain; Onsite Storage; Organics; Public Exposure; RCRA; Soil; State Criteria; Temporary Storage.

SYNTEX VERONA, MO
First Remedial Action - Final
May 5, 1988

ROD ABSTRACT

The Syntex Verona (SV) site, formerly operated as Hoffman-Taff, Inc., was purchased in 1969 by Syntex Agribusiness. The site is located 30 miles southwest of Springfield in extreme southwestern Missouri. Approximately 500 people live in Verona, Missouri, which borders on the site. The site area encompasses approximately 180 acres along the east bank of the Spring River. The majority of the active portion of the facility is located within the Spring River 100-year flood plain. SV was used to manufacture hexachlorophene from 1970 to 1971, which produced the byproduct 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), referred to as dioxin. From 1971 to 1988 EPA and Syntex Verona conducted numerous site investigations. The findings showed contamination both on- and offsite which may be related to the former activities at the site. The major areas identified as being contaminated are the Slough Area, Lagoon Area, Spill Area/Irrigation Area, Burn Area, and Trench Area. Dioxin contamination ranged from 1 ug/kg to 1,380 ug/kg, with the maximum concentrations occurring in the Lagoon Area. In addition to dioxin contamination, other organics and inorganic compounds were identified. The concentrations of these compounds were below the level of concern for human health. The primary contaminant of concern affecting the soil is dioxin.

The selected remedial action for this site includes: excavation and offsite thermal treatment of dioxin-contaminated soil exceeding 20 ug/kg and offsite disposal of the ash residue; dismantling and decontamination of equipment with a series of solutions and aqueous rinses; installation of a clay cap with a vegetation cover over the Trench Area; and maintenance of vegetation cover over surface soil containing levels of dioxin from 1 ug/kg to 20 ug/kg. The estimated present worth cost for this remedial action is $5,617,000.

PERFORMANCE STANDARDS OR GOALS: A site-specific action level of 20 ug/l has been established as an appropriate cleanup level for dioxin-contaminated soil.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Carcinogenic Compounds; Debris; Direct Contact; Dioxins; Excavation; Filling; Flood Plain; Incineration; Inorganics; Offsite Disposal; Offsite Treatment; Organics; RCRA; Soil; State Criteria; Temporary Storage; Treatment Technology.

TIMES BEACH, MO
Second Remedial Action
September 29, 1988

ROD ABSTRACT

The Times Beach site is a 0.8 square-mile area located in the formerly incorporated city of Times Beach, St. Louis County, Missouri, approximately 20 miles southwest of the city of St. Louis. The site is bordered on the north and east by the Meramec River and areas of St. Louis County, on the south by areas of Jefferson County, and on the west by the City of Eureka. Land use of the surrounding areas is primarily residental and agricultural. The majority of the site falls within the five-year flood plain and the entire site falls within the 25-year flood plain of the Meramec River. The soil contamination at the site is a result of spraying roads for dust control in the 1970s with oil that was contaminated with dioxin. Investigations indicate that the contamination is limited to the roads, road shoulders, and drainage ditches along the roads and is generally limited to the top twelve inches of the soil. Approximately 13,600 cubic yards of soil at concentrations above 20 ppb dioxin as well as 105,000 cubic yards of structures and debris are estimated to be contaminated. No detectable levels of dioxin have been found in the ground water or surface water at the site thus far. Based on the analytical results of soil samples collected in 1982 and on an advisory from the Centers for Disease Control, EPA determined that all residents and businesses should be relocated. In February 1983, EPA transferred CERCLA funds to the Federal Emergency Management Agency to conduct relocation activities. The primary contaminant of concern affecting the soil at this site is 2,3,7,8-TCDD (dioxin).

The selected remedial action for the site includes: demolition and onsite disposal of all structures and debris remaining at the site; excavation of dioxin-contaminated soil exceeding 20 ppb and thermal treatment in a temporary onsite thermal treatment unit with onsite disposal of incinerator ash; placing of clean soil cover and revegetation over all areas with residual dioxin levels between 1 and 20 ppb; construction of a ring levee surrounding the temporary thermal treatment unit for flood protection; interim storage of excavated soil onsite pending availability of the thermal treatment unit; and implementation of erosion controls. The estimated total capital cost for this remedial action is $48,800,000, which includes all costs from the Minker/Stout/Romaine Creek site.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels will attain a 1 ppb dioxin level at the ground surface and a 5 to 10 ppb dioxin level at a depth of one foot or greater. Thermal treatment will attain six-nines destruction and removal efficiency of dioxins from soil.

INSTITUTIONAL CONTROLS: Institutional controls will be established to control future land use and to prevent future residental development.

TIMES BEACH, MO
Second Remedial Action
(Continued)

KEYWORDS: ARARs; Carcinogenic Compounds; Dioxin; Direct Contact; Excavation; Flood Plain; Incineration; Ingestion; Inhalation; Institutional Controls; Levees; O&M; Onsite Disposal; Onsite Treatment; Public Exposure; RCRA; Relocation; Soil; State Criteria; Temporary Onsite Storage; Thermal Treatment; Treatment Technology.

ANACONDA SMELTER/MILL CREEK, MT
First Remedial Action
October 2, 1987

ROD ABSTRACT

The 160-acre community of Mill Creek is located in Deerlodge County, Montana, immediately adjacent to the Anaconda Smelter NPL site. The community of Mill Creek has been contaminated for over 100 years with smelter emissions, fugitive emissions of flu dust at the smelter, and continued fugitive emissions emanating from adjacent highly contaminated soils. Settled flue emissions in the community of Mill Creek, from the now defunct copper smelting operation, contain arsenic, cadmium, and lead. Environmental testing of the community and biological testing of pre-school children, led EPA to conclude that contamination in the Mill Creek area poses an imminent and substantial endangerment to the health of individuals residing there. In combination with future operable units for Mill Creek, the goal of this interim remediation is to provide adequate permanent protection for the health of current residents and interim protection for future short-term visitors to the area. The primary contaminant of concern at this site is arsenic. Cadmium and lead are secondary contaminants of concern.

The selected remedial action for this site includes: permanent relocation of all residents (8 homes) with temporary erosional stabilization of disturbed areas by establishing and maintaining a vegetative cover; demolition, consolidation, and temporary onsite storage of debris; fencing and posting of the entire site; and implementation of site access and deed restrictions. The estimated present worth cost for this remedial action is $300,000.

PERFORMANCE STANDARDS OR GOALS: Risk-based performance goals for arsenic and cadmium were less than background levels and appear technically unattainable. Therefore, background levels for arsenic 0.01 ug/m^3 and cadmium 0.01 ug/m^3 will be met. The NAAQS for lead 1.5 ug/m^3 also will be met.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to control site access and future land use.

KEYWORDS: Air; ARARs; Arsenic; Background Levels; Clean Air Act; Direct Contact; Inorganics; Interim Remedy; Lead; Metals; Onsite Containment; Relocation.

BRODERICK WOOD PRODUCTS, CO
First Remedial Action
June 30, 1988

ROD ABSTRACT

The Broderick Wood Products Company (BWP) site, is located in Adams County, Colorado, and encompasses approximately 64 acres. It is situated in a primarily industrial area and is bounded on the southwest and southeast by railroad tracks and on the north by Fisher Ditch. The site is one-half mile south of Clear Creek, a perennial stream. The nearest residences are less than one-eighth mile north of the property line. Major site features include two surface impoundments and a total of 19 buildings and structures. Between 1947 and 1981, BWP operated a wood treatment facility to treat power poles, fence posts, railroad ties and other wood products. Process wastes from the plant were conveyed through a clay pipe to the two onsite, unlined surface impoundments, referred to as the main and secondary impoundments and located in the northwest corner of the facility. Records indicate that waste seepage was apparent just north of the site and became so extensive that the waste was burned off, starting in 1955. Records also indicate that four additional ponds periodically were utilized. In August 1980, BWP submitted a RCRA permitting application and obtained interim status to operate its facility but ceased operations in November 1981. Site investigations conducted by EPA in April 1981 and July 1982 noted several violations of RCRA requirements. Another site inspection in December 1982 revealed the possibility of serious contamination at a trench in the vicinity of the surface impoundments that reportedly had only been used for the disposal of solid waste. A black stain and oily puddle were noted at the bottom of the trench. Wood treating chemicals also were detected in a ground water monitoring well located immediately downgradient of the surface impoundments. A source of contamination at the site that will be addressed in this remedial action is a result of a fire in July 1985 that damaged the treatment plant building. Water used to fight the fire was contaminated with asbestos fibers from the building insulation. This contaminated water was pumped to onsite holding vessels and some still remains in the basement of the building. The main and secondary impoundments have been identified as the major sources of site contamination. The main impoundment contains a surface layer of oil and grease, a water layer, and a sludge layer. The secondary impoundment contains primarily a sludge layer. The quantity of sludge from the two impoundments is estimated to be approximately 4000 yd^3, and is designated as RCRA K001 hazardous waste. Approximately 31,000 yd^3 of contaminated soil is estimated to be below the impoundments. The primary contaminants of concern from the impoundments affecting the soil and ground water are VOCs including benzene, organics including PAHs, PCPs, dioxins, and metals including lead.

The selected remedial action for this site includes: installation of access restrictions; excavation and onsite mobile incineration of the sludge and oil in the main and the secondary impoundments, with offsite disposal of the residual ash; treatment of contaminated impoundment wastewater using carbon adsorption with disposal through onsite evapo-transpiration or use as

incinerator quench water; excavation of the visibly contaminated soil beneath the impoundments, and onsite incineration if the volume is less than 2,500 yd^3, or onsite storage for further studies, if the volume is greater than 2,500 yd^3; filtration of water from the facility area to remove asbestos fibers, and treatment using carbon adsorption, with disposal through onsite evapo-transpiration or use as incineration quench water; and ground water monitoring. The estimated present worth cost for this remedial action ranges between $2,264,000 and $3,603,200.

PERFORMANCE STANDARDS OR GOALS: Cleanup goals will meet specified BDAT levels for RCRA K001 sludge, as determined by testing the incinerator ash to ensure that concentrations do not exceed the following levels: zinc 0.066 mg/l (TCLP), lead 0.53 mg/l (TCLP), copper 0.71 mg/l (TCLP), xylenes 0.162 mg/kg, toluene 0.143 mg/kg, pyrene 7.28 mg/kg, phenanthrene 7.98 mg/kg, PCP 36.75 mg/kg, and napthalene 7.98 mg/kg. Wastewater contaminants will be treated to non-detectable levels to comply with State standards. If these levels cannot be met, State standards will be waived and contaminants will be treated to MCLs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Asbestos; Benzene; Carcinogenic Compounds; Dioxin; Direct Contact; Excavation; Granular Activated Carbon; Ground Water Monitoring; Incineration; Leachability Tests; Lead; Metals; MCLs; Offsite Disposal; Oils; Onsite Treatment; Organics; PAHs; Phenols; RCRA; Safe Drinking Water Act; Sludge; Soil; State Criteria; Temporary Storage; Thermal Treatment; Treatability Studies; Treatment Technology; VOCs.

CALIFORNIA GULCH, CO
First Remedial Action
March 29, 1988

ROD ABSTRACT

The California Gulch site is located in Lake County, Colorado, approximately 100 miles southwest of Denver. The study area for this first remedial action encompasses an 11.5 m^2 watershed, which includes the city of Leadville, that drains along California Gulch to the Arkansas River. Between 1859 and 1986, the area was extensively mined for gold, lead, silver, copper, zinc and manganese. Because of these mining operations, the Yak Tunnel was constructed to dewater mines and facilitate mineral exploration and development. Studies indicate that the Yak Tunnel discharges a combined total of 210 tons per year of cadmium, lead, copper, manganese, iron, and zinc into California Gulch, which drains into the Arkansas River. Both California Gulch and the Arkansas River are used by the public for recreation, and the Arkansas River is heavily used for irrigation, livestock watering, public water supply and fisheries as well. Surface water contamination is the major impact of the Yak Tunnel discharge. Heavy metal migration through surface water has also caused ground water and sediment contamination. Primary contaminants of concern affecting the surface water, sediments, and ground water are cadmium, copper, lead and zinc.

The selected remedial action for this site includes: construction of surge ponds at the portal of Yak Tunnel to protect the California Gulch site and the Arkansas River from accidental release of acid water, sludge, and sediments; construction of concrete plugs at locations in the tunnel to reduce migration of contaminated water and reduce the extraction of metals from raw mineral ore; sealing shafts and drill holes, diversion of surface water away from tunnel recharge areas, and grouting of highly fractured rock; implementation of a monitoring program to detect leaks, seeps or migration of contaminated ground water; and installation of an interim treatment plant to treat ground water, which will be pumped to control surface seeps and migration of contaminated surface water. The estimated capital cost of the selected remedy is $11,982,770 with annual O&M costs of $460,307.

PERFORMANCE STANDARDS OR GOALS: This operable unit invokes an interim remedy waiver. Because of other sources affecting surface water contamination, the remedy does not expect to attain chemical-specific cleanup goals for surface water. Response actions in subsequent operable units, in combination with this remedy, will attain a level or standard of control at least equivalent to ARARs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Interim Remedy; Lead; Metals; Mining Wastes; O&M; Onsite Treatment; Public Exposure; Sediments; Surface Water; Surface Water Diversion.

CENTRAL CITY/CLEAR CREEK, CO
Second Remedial Action
March 31, 1988

ROD ABSTRACT

The Clear Creek/Central City site is located approximately 30 miles west of Denver in Clear Creek and Gilpin Counties, Colorado. The site consists primarily of acid mine drainages from five mines/tunnels and adjacent milling and mining wastes. Currently, acid mine drainage and runon and runoff from the tailings and waste rock piles have affected downstream surface water quality. In addition to the direct discharge from the mine tunnels, contaminated water may enter Clear Creek and North Clear Creek during overland sheet flow. This occurs during rapid snowmelt and storms. The resulting surface flow across the tailings and waste rock piles dissolves soluble minerals and transports particulate tailings and waste rock materials into the creeks. All this results in elevated creek acidity and metal loads. The introduction of tailings and waste rock into the creeks could also occur due to catastrophic collapse of tailings and waste rock piles during a flash flood or as a result of undercutting of the base of the pile under any flow regimen. The discharges from the five tunnels were addressed in the first remedial action operable unit for this site. The primary contaminants of concern for human receptors in surface water include: aluminum, arsenic, cadmium, chromium (IV), lead, manganese, nickel, and silver. For aquatic receptors, the above list expands to include: copper, fluoride, and zinc.

The selected remedial action for this site includes: slope stabilization at the Big Five Tunnel and Gregory Incline; monitoring of the gabion wall at the Gregory Incline; and run-on control at the Argo Tunnel, Big Five Tunnel, Gregory Incline, National Tunnel, and the Quartz Hill Tunnel. The estimated present worth cost for this remedial action is $1,049,600.

PERFORMANCE STANDARDS OR GOALS: The selected interim remedy requires the exercise of the "interim remedy" from the contaminant-specific ARARs listed in the FS.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Carcinogenic Compounds; Chromium; Direct Contact; Inorganics; Interim Remedy; Lead; Metals; Mining Wastes; O&M; Public Exposure; Surface Water; Surface Water Collection/Diversion.

INDIAN BEND WASH, AZ
First Remedial Action
September 21, 1988

ROD ABSTRACT

The Indian Bend Wash site (IBW) encompasses 13 square miles in Scottsdale and Tempe, Arizona. The portion of the site addressed in this remedial action, the Scottsdale Ground Water Operable Unit, covers approximately eight square miles within the Scottsdale city limits. The Indian Bend Wash, a flood protection mechanism, runs north - south through the site and supports recreational uses. Ponds in the wash are used as a water collection system. The land use of this area is primarily residential with approximately 30 percent used for commercial, light industrial and developed recreational purposes. The resident population of Scottsdale was 115,500 in 1986, and is expected to reach 129,500 by 1990. Approximately 70 percent of the City of Scottsdale's municipal water currently is supplied by ground water. Future population growth will require greater use of ground water resources, particularly from the contaminated areas. In 1981, TCE was discovered in the ground water from several City of Scottsdale and City of Phoenix municipal wells at concentrations exceeding the Arizona Department of Health Services action levels. Several facilities within the site boundaries have records of past use of TCE in their manufacturing process. Seven of the 12 city wells within the boundaries of this operable unit have levels of VOCs exceeding primary drinking water standards. One of the seven is equipped with a VOC treatment facility and is used as a potable water supply source. The other six wells are currently offline. The site was placed on the NPL in 1982. The primary contaminants of concern affecting the ground water are VOCs including TCE and PCE.

The selected remedial action for this operable unit of the site includes: extraction of ground water by pumping City of Scottsdale Wells No. 31, 71, 72 and 75 at a minimum of 75 percent of their historical capacities; treatment of ground water using packed column aeration to transfer the VOCs from the water to air, with vapor phase GAC adsorption to remove VOCs from the air waste stream; and distribution of the treated water to the City of Scottsdale municipal water system. This remedial action addresses ground water contamination only in the Middle and Lower Alluvium Units beneath the north portion of IBW within the Scottsdale City limits. Contamination beyond these limits in the ground water of the Upper Alluvium limit and in the soil will be addressed in subsequent remedial actions for the IBW site. The estimated total capital cost for this operable unit is $4,008,000 with an estimated annual O&M cost of $520,000.

PERFORMANCE STANDARDS OR GOALS: Treatment of the ground water will reduce contamination to levels below MCLs and State action levels. Specific treatment goals include TCE 5 ug/l (MCL), TCA 200 ug/l (MCL), DCE 7 ug/l (MCL), and PCE 0.67 ug/l.

INDIAN BEND WASH, AZ
First Remedial Action
September 21, 1988
Continued

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Air Stripping; ARARs; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Treatment; PCE; Safe Drinking Water Act; Solvents; State Criteria; TCE; Treatment Technology; VOCs.

LORENTZ BARREL & DRUM, CA
First Remedial Action
September 25, 1988

ROD ABSTRACT

The 5.4-acre Lorentz Barrel & Drum (LB&D) site is located in San Jose, California, about 0.25 mile from San Jose State University. The site lies directly above a major source of potable ground water in the south San Francisco Bay area, with three public water supply well fields within one mile of the site. In 1947 the Lorentz family began a drum recycling operation on 10.5 acres of land at the site. Currently, 4.5 acres are capped with tar and gravel but contains stored drums, 0.75 acre includes the reconditioning facilities. Drums containing residual aqueous wastes, organic solvents, acids, oxidizers, caustic residues and oils were received for recycling. During the early years of operation, portions of the site were also leased to other companies. Between 1950 and 1978 a drainage ditch north of the drum processing building carried process wastes to a large sump and other ponding areas onsite. Prior to 1968 wastes from the sump were discharged to a storm drain system. Sometime between 1968 and 1971 the discharge was diverted to a sanitary sewer, and investigations indicate that this discharge occurred until 1984. After this time, liquid wastes were evaporated, drummed and disposed of as hazardous waste along with incinerator ash, residual liquids, and sludge. Subsequent surface runoff was collected and recycled in the hot caustic drum wash. Since 1981 several investigations have revealed soil and ground water contaminated with numerous metals, organics, and PCBs. Removal of drums, stored hazardous materials, and highly contaminated soil has been conducted at the site. This remedial action will address the offsite contaminated shallow ground water. Onsite contaminated soil and additional shallow and deep ground water remediation will be addressed in a subsequent remedial action. The primary contaminants of concern affecting soil and ground water are VOCs, including benzene, PCE and TCE, other organics including PCBs and pesticides, and metals including arsenic and nickel.

The selected Expedited Response Action for this site includes: onsite ground water pump and treatment using ozone/UV for organic removal and ion exchange for nickel removal, with discharge of treated water to a local creek. The estimated present worth cost for this remedy is $3,238,000 with annual O&M costs of $198,000.

PERFORMANCE STANDARDS OR GOALS: Treatment of ground water will attain levels at or below MCLs and NPDES discharge limit requirements. Specific treatment levels include: benzene, PCE, and TCE 5.0 ug/l (MCLS), PCBs 0.065 ug/l, and arsenic 0.23 ug/l. PCBs and pesticides will be removed to detection limits.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Arsenic; Benzene; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; PCBs; PCE; State Criteria; TCE; Treatibility Studies; Treatment Technology; VOCs.

MGM BRAKES, CA
First Remedial Action-Final
September 29, 1988

ROD ABSTRACT

The MGM Brakes site consists of a five-acre plot containing an automotive brakes casting plant, a paved area surrounding the plant, and an open field. It is located in the city of Cloverdale, California, in Alexander Valley, approximately 80 miles north of San Francisco. Forty homes, an apartment complex, a church, an animal grazing area, and several construction companies exist within a half-mile radius of the site. In addition, a 200 unit housing development is under construction immediately adjacent to the site. Surface water drainage from the site flows into Icaia Creek which flows into the Russian River. From 1965 until 1972, wastewater containing PCBs was discharged onto site property. Wastewater containing ethylene glycol was disposed onsite between 1972 and 1981. The ethylene glycol acted as a co-solvent with water, facilitating the transport of PCBs in soil. Approximately 13,510 yd^3 of soil within a 3-acre area have been contaminated with PCBs at concentrations up to 4500 ppm. The majority of contamination is present at depths of less than 5 feet (although contamination to 29 feet was found in one area). In addition, VOCs have been detected in ground water from wells on and near the site. However, the source of this contamination is unknown. The primary contaminants of concern affecting ground water are VOCs including TCE and benzene. The primary contaminants of concern affecting soil, sediments, surface water, and air are PCBs.

The selected remedial action for this site includes: dismantling of the MGM Brakes process building; crushing of concrete slab, and excavation of soil and of contaminated sediments in the drainage ditch containing PCBs at levels greater than or equal to 10 mg/kg, with disposal in an offsite California regulated Class II landfill if below 50 ppm and a TSCA-approved landfill if above 50 ppm; determination and removal of VOC-contaminated soil and offsite RCRA disposal; treatment of dewatered ground water for PCBs and VOCs through use of an onsite mobile treatment unit and discharge to a publicly owned treatment works (POTW); soil replacement, regrading, compaction, and revegetation; offsite ground water monitoring to determine extent of VOC contamination; and development of additional remedial measures, if warranted. The estimated capital cost for this remedial action is $5,369,300 with no annual O&M costs.

PERFORMANCE STANDARDS OR GOALS: Soil containing greater than or equal to 10 mg/kg PCBs (equal to 10^{-5} cancer risk) will be removed. Ground water will be restored to MCL or other health-based levels such that the total risk from VOC contamination at the site boundary does not exceed 10^{-6}. Discharge levels of treated ground water to the local POTW will meet the requirements of the California North Coast Regional Water Quality Control Board's Water Quality Control Plan.

INSTITUTIONAL CONTROLS: Implementation of institutional controls is not necessary because the selected remedy will not result in hazardous substances remaining onsite above health-based levels.

MGM BRAKES, CA
First Remedial Action-Final
(Continued)

KEYWORDS: ARARs; Benzene; Carcinogenic Compounds; Debris; Direct Contact; Drinking Water Contaminants; Drinking Water Standards; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Offsite Discharge; Offsite Disposal; Onsite Treatment; Organics; PCBs; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediments; Soil; State Criteria; TCE; Toxic Substances Control Act; VOCs.

MOTOROLA 52ND STREET, AZ
First Remedial Action
September 30, 1988

ROD ABSTRACT

The Motorola 52nd Street site is located in the eastern part of the City of Phoenix, Maricopa County, Arizona. The site is bounded by the Phoenix Military Reservation and mixed residential and commercial neighborhoods. The site is currently owned by Motorola, Inc., which operates a manufacturing facility at the site using solvents for various manufacturing processes. In January 1983, Motorola tested some underground storage tanks used to store virgin solvents for leaks and determined that a 5,000-gallon tank containing TCA was leaking. Subsequently, Motorola conducted a preliminary investigation, which indicated soil and ground water contamination on the plant site and ground water contamination offsite to the west. Motorola initiated an onsite ground water treatment program in 1986, which included treatability testing, design and installation of a Pilot Treatment Plant (PTP), treatment of ground water, and beneficial use of the effluent in the plant's air fume scrubbers. The PTP is still in operation. The selected remedy for this ROD requires partial cleanup of onsite and offsite organic solvents contamination in the soil and alluvium groundwater. A subsequent remedial action will address cleanup of all onsite and offsite contamination in the soil, alluvium ground water, and the bedrock underlying the alluvium. The primary contaminant of concern affecting the soil and ground water is TCA.

The selected remedial action for this site includes: onsite soil-gas extraction and treatment using granular activated carbon systems; pump and treatment of on- and offsite ground water with treatment onsite and use of the treated ground water in site manufacturing processes; and ground water monitoring. The estimated present worth cost for this remedial action is $7,600,000 with annual O&M costs of $700,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup will meet relevant State and Federal standards including Maricopa County Pollution Control discharge standards. Individual contaminant goals were not specified.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Drinking Water Contaminants; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Metals; O&M; Onsite Treatment; Organics; RCRA; Safe Drinking Water Act; Soil; Solvents; State Permit; Treatment Technology; Vacuum Extraction; VOCs.

OPERATING INDUSTRIES, CA
Second Remedial Action
November 16, 1987

ROD ABSTRACT

The Operating Industries, Inc. (OII) site is a 190-acre landfill located in Monterey Park, California. The City of Montebello borders the southern parcel of the landfill and has a population of 52,929 residents. Several residences are located immediately adjacent to the landfill boundaries. Between 1948 and 1984, the landfill was used for the disposal of municipal and industrial waste (some of which would currently be classified as hazardous waste). Beginning in 1976, the landfill was permitted to receive liquid hazarous waste between 1976 and 1983, and accepted over 200 million gallons of manifested liquid waste. Over its 36-year life span, the OII landfill has accepted several types of waste including: residential and commercial refuse; water-insoluble, nondecomposable inert solids; liquid wastes; various hazardous wastes including waste water treatment sludge from production of chrome oxide green pigment; and slop oil emulsion solids and tank bottom sludges (leaded) from petroleum refining operations. Both landfill gas and leachate are generated at the OII site. Several gas and leachate collection systems were constructed by the owners of OII during the early 1980s to partially control landfill gas and prevent surface seepage of leachate. GSF, Inc. also constructed a commercial methane recovery system at the site and began extracting gas from the landfill for processing and sale in 1979. Leachate was redisposed at the landfil until October 1984; since then, collected leachate has been stored in tanks onsite and transported to a permitted offsite treatment facility. The collected leachate contains VOCs. EPA took over day to day operations and maintenance of the site and existing site systems as an emergency response action in May 1986. EPA has conducted a number of othe emergency actions to mitigate some of the potential threats to public health and the environment which are posed by the site. GSF, Inc. abandoned their gas extraction operations in the spring of 1987, and EPA has operated the GSF system since that time. In July 1987 EPA signed a Record of Decision addressing site control and monitoring activities, which have since been conducted by EPA as a remedial action. This ROD is designed to address the approximately 10,000 gallons of leachate that are expected to be collected before implementation of a final site remedy. The leachate generated contains VOCs including benzene, TCE, toluene, and vinyl chloride.

The selected remedial action for this site includes: onsite treatment of leachate and other collected hazardous liquids by air stripping and granular activated carbon adsorption in a facility constructed at onsite location B, with discharge to the Los Angeles County Sanitation District sewerage system for treatment at a POTW. The estimated five-year capital cost for this remedial action is $1,900,000 with estimated five-year annual O&M of $700,000.

PERFORMANCE STANDARDS OR GOALS: Leachate will be treated to achieve the 10^{-6} health-based Los Angeles County Sanitation District (LASCD) Industrial Discharge Requirements. Individual effluent discharge limits include: arsenic 3.0 mg/l, chromium 2.77 mg/l, copper 3.38 mg/l, zinc 2.61 mg/l, oil and grease 10.0 mg/l, total toxic organics 1.0 mg/l, and vinyl chloride 15 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Granular Activated Carbon; Leachate Treatment/Collection; O&M; Offsite Discharge; Onsite Treatment; POTW; RCRA; State Criteria; TCE; Toluene; VOCs.

OPERATING INDUSTRIES, CA
Third Remedial Action
September 30, 1988

ROD ABSTRACT

The Operating Industries Inc. (OII) site is a 190-acre landfill located in Monterey Park, California, 10 miles east of Los Angeles. To the northwest and east of the site the land use is primarily industrial; residential units are located to the southwest, east and west of the site. There are approximately 53,000 residences within a 3-mile radius of the site. Available data indicate that 2,150 people live within 1,000 feet of the landfill. Disposal activities at the site began in October 1948 by the Monterey Park Disposal Company (MPDC) who used the site as a municipal landfill on behalf of the City of Monterey Park. In 1952, the site and additional land, totalling 218 acres, were purchased by OII. The landfill was permitted to accept household refuse, organic refuse, scrap metal, non-decomposable inert solids, and certain types of liquids. In 1964, the State of California purchased 28 acres of the land owned by OII to construct the Pomona Freeway, which divided the site into two sections. In 1975, Monterey Park City limited solid waste disposal to a 130-acre section of the landfill and a year later restricted disposal of liquids to a 32-acre section of the landfill. In April 1983, OII ceased accepting all liquid wastes; disposal of all solid wastes ended in October 1984. EPA currently is performing operation and maintenance of the existing leachate collection system, perimeter gas extraction system and interior gas extraction system. This remedial action addresses only the issue of landfill gas (LFG) migration control and destruction. Final cover, leachate collection, ground water and soil contamination, slope stability and final closure will be addressed in subsequent remedial action. The primary contaminants of concern affecting the air are methane and VOCs including benzene, PCE, TCE and toluene.

The selected remedial action at the site includes: installation of perimeter LFG extraction wells, pile-driven wells on the top deck of the landfill, shallow and deep slope wells to control intermediate-to-deep subsurface migration at the perimeter, and integrated perimeter and interior LFG headers; utilization of existing gas extraction wells and gas monitoring probes; installation of multiple completion monitoring wells at the property boundary, landfill gas destruction facilities and an automated control station for the gas control system; and installation of abovegrade condensate sumps to collect condensate from gas headers, leachate pumps in gas wells to dewater saturated zones, and abovegrade leachate sumps. The selected remedial action for the North Parcel system includes: installation of 6 single completion extraction wells to the depth of the refuse and installation of 1,500 feet of header lines. The estimated present worth for this remedial action is $73,000,000 with an annual O&M cost of $2,340,000.

PERFORMANCE STANDARDS OR GOALS: This remedy will attain State-required levels for vinyl chloride ambient concentrations of 10 ug/l over a 24-hour period, carbon monoxide emissions of 2,000 mg/l and sulfur dioxide emissions of 500 mg/l. The risk of fire or explosion due to landfill gas accumulating offsite will be eliminated by controlling methane concentrations to less than five percent of the landfill boundary. The leachate and condensate that will be collected from the gas control system will be treated to levels established by the POTW pretreatment requirements.

OPERATING INDUSTRIES, CA
Third Remedial Action
(Continued)

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Air Monitoring; ARARs; Benzene; Carcinogenic Compounds; Clean Water Act; Leachate Collection Treatment; Onsite Treatment; O&M; PCE, Publicly Owned Treatment Works (POTW); State Criteria; TCE; Toluene; Treatment Technology; Venting; VOCs.

ORDOT LANDFILL, GU
First Remedial Action - Final
September 28, 1988

ROD ABSTRACT

The Ordot Landfill site is located on the Island of Guam. The landfill is in a volcanic upland region, where site runoff flows directly into the adjacent Lonfit River. Water wells have not been drilled in the volcanics near the landfill. There is concern, however, that a suspected fault near the landfill may provide a hydrologic connection between the contaminants at Ordot Landfill and Guam's major drinking water acquifer located in the northern limestone province of Guam. The landfill is presently managed and operated by the Guam Department of Public Works, and has been receiving uncontrolled municipal wastes since before World War II. Because it is the only major public waste disposal site on Guam it has received some hazardous waste during its history, including spent industrial and commercial chemicals, PCB-contaminated oils from transformers, and perhaps munitions. The facility uses almost the entire 47-acre waste disposal area, with only approximately 4 to 7 acres of the oldest portion of the landfill not currently in use. The current depth of disposed wastes is approximately 100 feet. In March 1986, EPA found Ordot Landfill in violation of the Clean Water Act for discharging landfill leachate to the Lonfit River without an NPDES permit. The 1987 initial site characterization study concluded that surface flow through the landfill is the source of leachate, the site is hydrologically isolated from the island's sole source aquifer, there is an absence of organic contaminants, inorganic contamination is below the appropriate MCLs, and no air quality problems exist. The study concluded that current threats to human health and the environment are a result of poor landfill operation practices and not a result of the few acres of the landfill which are no longer in operation. The primary contaminants of concern affecting the ground water and surface water include iron and manganese.

The selected remedial action for this site is the no action alternative. EPA concludes that threats to human health and the environment can best be mitigated through addressing operation and maintenance of the landfill, and that the appropriate mechanism for implementing these controls is through enforcement of the Clean Water Act. Further, EPA concludes that any remedial action to address the inactive portion of the landfill would be jeopardized or nullified unless operation practices at the active disposal areas are improved. No costs are associated with the no action alternative.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Clean Water Act; Inorganics; Metals; Leachate Collection; Municipally-Owned Site; No Action Remedy; Sole-Source Aquifer; Water Quality Criteria.

SAN GABRIEL VALLEY (AREAS 1, 2, and 4), CA
Second Remedial Action
September 29, 1988

ROD ABSTRACT

The San Gabriel Valley sites consist of four large areas of ground water contamination located approximately 10-20 miles east of Los Angeles in Los Angeles County, California. The sites include industrial, commercial, residential, and undeveloped areas. The contaminated ground water underlies significant portions of several cities and outlying areas of the San Gabriel Valley, and appears to be the result of inadequate handling and disposal of industrial solvents by dozens of industrial/commercial facilities. The Main San Gabriel Ground Water Basin, which underlies the San Gabriel Valley, provides over 90% of the water supply for over 1 million people. Ground water and surface water, including the San Gabriel and Rio Hondo rivers, flow predominantly to the southwest through Whittier Narrows. Drainage through Whittier Narrows enters Central Basin to the south, another major water supply source. Ground water discharges to surface water in several locations including a creek in the southwest portion of the valley and the San Gabriel and Rio Hondo rivers near Whittier Narrows. Ground water contamination by VOCs has been detected in over 50 wells at concentrations above the action levels established by the California Department of Health Services. This ROD addresses contamination in the Bartolo Well Field, a private water utility, owned and operated by Suburban Water Systems (SWS) and located along the east side of the San Gabriel River in the Whittier Narrows area. The Bartolo Well Field consists of four public water supply wells that provide over 55 percent of the water supply for approximately 17,000 commercial and residential water customers in SWS's Whittier Service District. They were first identified as contaminated in the the fall of 1986. This action is the first phase of a larger remedial action planned for the Whittier Narrows area and addresses only a small part of the contamination in the San Gabriel Valley Areas 1, 2, and 4 sites. The objective of this action is to partially control the movement and spread of contaminants in the Whittier Narrows area of the San Gabriel Valley, thereby contributing to aquifer restoration of the San Gabriel Valley Areas 1, 2, and 4 sites. Additionally, this action will address the potential public health threat posed by the SWS's Bartolo Well Field. The primary contaminants of concern affecting the ground water are VOCs including PCE and TCE.

The selected remedial action for this site includes: onsite ground water pump and treatment using an air stripping system equipped with air emissions controls, with subsequent discharge to the utility's water distribution system; floodproofing the treatment facility; and ground water monitoring.

SAN GABRIEL VALLEY (AREAS 1, 2, and 4), CA
Second Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: Ground water treatment will attain a cumulative 10^{-6} cancer risk level and meet MCLs for TCE 5 ug/l and DCE 7 ug/l. State action levels will be attained by remediating PCE to below 1.0 ppb.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; ARARs; Direct Contact; Drinking Water Contaminants; Flood Plain; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Offsite Discharge; O&M; Onsite Treatment; PCE; Public Exposure; Safe Drinking Water Act; State Criteria; TCE; Treatability Studies; Treatment Technology; VOCs.

SELMA PRESSURE TREATING, CA
First Remedial Action - Final
September 24, 1988

ROD ABSTRACT

The Selma Pressure Treating site is located in Selma, California, 15 miles south of the City of Fresno. The site encompasses approximately 18 acres, including a 3 to 4-acre wood treatment facility and 14 acres of adjacent vineyards that were used for site drainage. Land use in the vicinity of the site includes agricultural, residential, and industrial areas, with 12 residences and businesses located within 0.25 mile. The ground water resources in the area have been classified as a Sole-Source Aquifer and a current drinking water source with other beneficial uses. Wood preserving activities using pentachlorophenol (PCP) were conducted at the site from 1942 until 1965 under a series of owners. In 1965, a new facility was constructed converting operations to a pressure treating process using chemical preservatives. Prior to 1982, wastes generated from spent retort fluids and sludges were discharged to drainage and percolation ditches, dry wells, and an unlined pond and sludge pit, as well as onto open ground and the adjacent vineyards. An inspection conducted by EPA in 1981 raised concerns about the potential for ground water contamination, and as a result the company was required to modify its operations to minimize the potential for contamination. The total volume of soil requiring remediation is approximately 16,100 yd^3. The primary contaminants of concern affecting the ground water and soil are organics including dioxin and phenols, and metals including arsenic and chromium.

The selected remedial action for this site includes: ground water pump and treatment using precipitation, coagulation, and flocculation with reinjection into the aquifer or offsite discharge; soil excavation and solidification/stabilization with replacement in excavated areas and capping fixed soil with a RCRA cap; ground water and soil monitoring for approximately 30 years; and long-term access and land use restrictions for fixed areas and short-term institutional controls for ground water use. The estimated present worth cost for this remedial action is $11,280,000 with annual O&M of $1,300,000.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup will attain the risk-based goals of dioxin/furan 1 ug/kg and arsenic 50 mg/kg to protect ground water. Ground water treatment will meet the State MCL for chromium of 50 ug/kg.

INSTITUTIONAL CONTROLS: Long-term access and land use restrictions will be placed on areas of fixed soil, and short-term institutional controls will be established to prevent use of contaminated ground water until remediation is complete.

KEYWORDS: ARARs; Arsenic; Capping; Chromium; Dioxin; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; Offsite Discharge; Onsite Treatment; Organics; Phenols; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Soil; Sole-Source Aquifer; Solidification/Stabilization; State Criteria; Treatment Technology.

SOUTH BAY ASBESTOS, CA
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The South Bay Asbestos (SBA) site is located at the northern end of the Santa Clara Valley and at the southernmost extent of San Francisco Bay, in Alviso, California. The site is within an area of approximately 330 acres, and is comprised of a mixture of residential, commercial, light industrial, and agricultural land uses. Approximately 1,700 residents live in Alviso. The site is comprised of a ring levee, which extends around the community of Alviso on the east, north and northwest. It is approximately four to twelve feet in height, two miles in length, has a trapezoidal shape, and covers an area of about eight acres. A narrow path exists along the crest of the levee. The levee was built by the City of San Jose in 1983 during a major flood caused by the Coyote Creek and the Guadalupe River. It lies within the 100-year flood plain of the Guadalupe River and was constructed on portions of wetland areas adjacent to the community of Alviso. It also abuts wetland areas next to a national wildlife refuge near Alviso. In August 1983, an excavation occurred on property owned by the City of San Jose involving the construction of an outfall structure at the Guadalupe River levee. The excavation revealed asbestos contamination ranging from 20 to 40 percent by area. Contaminated soil was removed between August and December 1983. A September 1983 soil sampling also revealed the presence of asbestos contamination throughout the community of Alviso, including the ring levee. As a result, EPA sprayed the ring levee with a polymer dust suppressant to control asbestos dust in May 1986, in 1987, and again in July 1988. The primary contaminant of concern affecting the soil is asbestos.

The selected remedial action for the ring levee includes: stripping and rough grading of the levee; placement of a compacted soil layer and a top soil cover followed by revegetation to prevent erosion; alteration of the side slopes and construction of a three-foot wide path on the crest of the levee; implementation of strict asbestos/dust control measures during the entire construction operation; and implementation of deed restrictions. The estimated present worth cost for this remedial action is $2,374,700 with annual O&M of $19,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedial action will be protective of public health by creating a barrier to control release of the asbestos fibers. No specific standards or goals were established. Compliance with OSHA Worker Exposure Standards will be maintained during the implementation of the remedy.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent the disturbance of the soil cover and possible release of asbestos fibers.

KEYWORDS: Air; Air Monitoring; ARARs; Asbestos; Capping; Carcinogenic Compounds; Clean Air Act; Containment; Deed Restrictions; Flood Plain; Inorganics; Institutional Controls; Levees; O&M; Onsite Containment; Public Exposure; Soil; State Criteria; Wetlands.

TUCSON INTERNATIONAL AIRPORT AREA, AZ
First Remedial Action
August 22, 1988

ROD ABSTRACT

The Tucson International Airport Area (TAA) site encompasses sections of southwest Tucson and adjoining lands south of the city in Pima County, Arizona. The site is located in the Tucson Basin and includes industrial, commercial, residential, and undeveloped areas, as well as the Tucson International Airport, the U.S. Air Force Plant #44 (AFP44), and part of the San Xavier Indian Reservation. The Santa Cruz River borders the site to the west. The ground water system in the Tucson Basin has been designated a Sole-Source Aquifer. Before the discovery of ground water contamination in the TAA, wells within the site boundaries provided water for over 47,000 people. At least 20 facilities have operated in the TAA since 1942. These include aircraft and electronics facilities, which discharged waste liquids directly to surface soil; fire drill training areas, where uncombusted residual wastes from training operations were left in unlined pits; and unlined landfills, which received various wastes from several sources. The first indications of ground water contamination in TAA appeared in the early 1950s when elevated levels of chromium were detected in a municipal supply well adjacent to AFP44 in the southern portion of the site, and residents in another area complained of foul-smelling water from private supply wells. In 1976, a well was closed at AFP44 by the State because of high levels of chromium. By 1981, additional sampling by the Air Force and EPA had indicated the presence of VOCs in the ground water. Consequently, in 1981, the City of Tucson began closing all municipal wells that exceeded the State Action Level for the principle contaminant TCE, and notified private well users of potential risks. The site was divided approximately in half along Los Reales Road, with the Air Force addressing contamination to the south and EPA addressing contamination to the north. In 1987, the Air Force began operating its ground water pump and treatment system using ion exchange and packed column aeration followed by reinjection into the aquifer. This ROD addresses the ground water contamination in the northern portion of the site, which together with the Air Force remedial ground water system constitutes the overall ground water remedy for the site. The northern portion of the site has been divided into two discrete areas, A and B. Area A lies west of the airport and extends approximately 3.5 miles to the northwest in the direction of ground water flow, and is generally less than a mile wide. Area B consists of two smaller separate areas north of the airport. If further investigations indicate that there is soil contamination and that it is a source of continuing ground water contamination, a ROD will be developed to address soil remediation. The primary contaminants of concern affecting ground water are VOCs including TCE, benzene, and xylenes.

TUCSON INTERNATIONAL AIRPORT AREA, AZ
First Remedial Action
(Continued)

The selected remedial action for this site includes: ground water pump and treatment of Areas A and B using packed column aeration, followed by discharge of treated water to the municipal water distribution system and treatment of emissions from the treatment process using granular activated carbon, if necessary. The estimated present worth cost for this remedial action is between $7,328,000 and $7,820,000 with annual O&M between $393,000 and $450,000 for years 1-20.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels will attain an overall excess cancer risk of 10^{-6} by remediating TCE to 1.5 ug/l. This will reduce the levels of other contaminants below their respective MCLs, State Action Levels, and 10^{-6} excess cancer risk concentrations.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; ARARs; Benzene; Carcinogenic Compounds; Containment; Direct Contact; Drinking Water Contaminants; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; Offsite Discharge; Onsite Treatment; Organics; Public Exposure; Safe Drinking Water Act; Sole-Source Aquifer; State Criteria; TCE; Treatment Technology; VOCs; Xylenes.

COMMENCEMENT BAY/NEARSHORE, WA
First Remedial Action
December 30, 1987

ROD ABSTRACT

The Tacoma Tar Pits site covers approximately 30 acres within the Commencement Bay - Nearshore/Tideflats site in Tacoma, Pierce County, Washington. The tar pits lie between the Puyallup River, the city, and Wheeler - Osgood Waterways. These bodies of water are not used as a water supply, but support extensive fish and shellfish populations. Currently there is concern for the site's impact on surface water quality and many local industries that use ground water from onsite wells. In 1924, a coal gasification plant began operations, and continued until 1956, at which time they were terminated due to the availability of natural gas. During these years, waste materials from the coal gasification process were disposed of onsite. Contained in the waste materials, were a wide variety of organic compounds and heavy metals. From 1965 to 1966, the plant was dismantled and demolished. Most of the metal structures were removed from the site; however, all demolition debris and below grade structures were left in place, including tanks and pipelines containing tars. In 1967, a metal recycling company began operating at the site. Recycling of automobile batteries introduced acid, heavy metals, lead, and PCBs to the soil. Several studies conducted by EPA and the Washington State Department of Ecology between 1981 and 1983 found contaminants derived from the coal gasification process. The primary contaminants of concern affecting surface water and soil include: benzene, PAHs, PCBs, and lead.

The selected remedial action for this site includes: excavation of all contaminated soils exceeding 1 percent total PAHs and all surface soils exceeding a 10^{-6} lifetime cancer risk level with stabilization of all excavated soils in a polymer/cement mixture; capping of the stabilized matrix with asphalt; channeling and managing of surface waters; ground water monitoring; and removal and treatment of ponded water. The estimated present worth cost for this remedial action is $3,400,000.

PERFORMANCE STANDARDS OR GOALS: All soils at a depth equal to or less than three feet will be treated to a 10^{-6} lifetime cancer risk. This equals 1 mg/kg for PCB (consistent with TSCA regulations), 1 mg/kg for PAHs, and 56 mg/kg for benzene. Surface soil containing more than 166 mg/kg lead will also be treated. All other soil exceeding 10,000 mg/kg PAH will be excavated and treated in accordance with the State law for the designation of extremely hazardous waste. These standards will be re-evaluated for technical feasibility when the Remedial Action is undertaken.

INSTITUTIONAL CONTROLS: Land use restrictions will be implemented.

KEYWORDS: ARARs; Benzene; Capping; Carcinogenic Compounds; Direct Contract; Excavation; Ground Water Monitoring; Institutional Controls; Lead; Metals; O&M; Oils; Organics; PAHs; PCBs; Public Exposure; RCRA; Soil; Solidification/Stabilization; Surface Water Diversion; Toluene; Toxic Substances Control Act; Treatment Technology; Water Quality Criteria; VOCs.

COMMENCEMENT BAY/TACOMA, WA
First Remedial Action - Final
March 31, 1988

ROD ABSTRACT

The Commencement Bay/Tacoma site is a 190-acre industrial/municipal landfill located in Pierce County, Tacoma, Washington. The landfill is operated by the City of Tacoma Refuse Utility and is surrounded primarily by residential development and open land, with some commercial and industrial development. Several utilities (i.e., sewer, water, and storm) pass through the site. An aquifer beneath the site provides drinking water to the Town of Fircrest and the City of Tacoma, both of which have wells near the landfill. The aquifer is also used by private individuals for their domestic water supply. Ground water flows predominatly to the southwest toward Leach Creek, which lies approximately 0.25 mile west of the landfill. Consequently, wetlands downstream of the landfill could potentially be exposed to contaminants in the surface water and ground water. The Tacoma landfill began operations in 1960, receiving only nonhazardous wastes including assorted municipal and industrial wastes, construction and demolition wastes, and bulk waste. To date, about 4 million tons of refuse have been deposited at the landfill to depths of 20 to 80 feet. Although the landfill does not accept hazardous wastes for disposal, it did receive wastes in the 1960s and 1970s that have since been designated as hazardous substances. In 1983, investigations by EPA revealed the presence of hazardous compounds in the ground water and soil near the landfill. Subsequent investigations indicated that the ground water is contaminated with VOCs. In response, the City of Tacoma connected affected residences to the public water system. In 1986, accumulation of landfill gas in a utility vault adjacent to the landfill resulted in a minor explosion. A field survey was initiated to evaluate the extent of offsite gas migration, and based on this survey a gas extraction system was constructed to extract, collect, and combust the gas. Gas samples collected at the landfill revealed high levels of VOCs. The primary contaminants affecting the ground water and surface water are VOCs including benzene, toluene, and xylenes.

The selected remedial action for this site includes: construction of a cap on the landfill with runoff directed to appropriate storm or sanitary sewers, and installation of a gas extraction system and gas probes to monitor methane gas production; installation of a ground water pump and treatment system with discharge of treated water to a local creek or the POTW and alternate water supply if needed; and ground water and surface water monitoring. The estimated present worth cost for this remedial action is between $21,015,000 and $23,418,000. The estimated O&M costs were not provided.

PERFORMANCE STANDARD OR GOALS: Ground water cleanup levels were provided for 10 contaminants of concern based on MCLs, WQC, pretreatment standards, or risk assessments. Individual goals include benzene 5 ug/l (MCL), toluene 14 ug/l (WQC), and xylene 10 ug/l (EPA Risk Assessment).

COMMENCEMENT BAY/TACOMA, WA
First Remedial Action - Final
(Continued)

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to restrict construction of water supply wells in the affected area.

KEYWORDS: Air Monitoring; Alternate Water Supply; ARARs; Benzene; Capping; Clean Water Act; Consent Decree; Containment; Deed Restriction; Direct Contact; Extraction; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Offsite Disposal; Offsite Treatment; Plume Management; Public Exposure; Publicly Owned Treatment Works (POTW); RCRA; RCRA Closure Requirements; Safe Drinking Water Act; State Criteria; Surface Water Monitoring; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

FRONTIER HARD CHROME, WA
First Remedial Action
December 30, 1987

ROD ABSTRACT

The Frontier Hard Chrome (FHC) site covering approximately one-half acre, is located in the City of Vancouver, Washington. Underlying ground water is used as the drinking water supply for the City of Vancouver. Two well fields are within one mile of the FHC site. The site has primarily been occupied by two businesses engaged in the chrome plating industry. Pioneer Plating operated at the site from 1958 to 1970. The site was then occupied by FHC until 1983. During Pioneer's operation and FHC's initial operation, chromium plating wastes were discharged to the sanitary sewer system. In 1975, the City of Vancouver determined that chromium in FHC's waste water was upsetting the operation of its new secondary treatment system. FHC was directed by Vancouver and the Washington Department of Ecology (Ecology) to cease discharge to the sewer system until a treatment system was installed to remove chromium from their waste. At that time, FHC began discharge of their untreated plating wastes to a drywell behind the facility. In 1976, FHC was given a waste water disposal permit for discharge to the drywell by Ecology. The permit also contained a schedule for completion of a treatment system for their wastes. In 1982, Ecology found FHC in violation of the Dangerous Waste Act for the illegal disposal for hazardous wastes. In 1983, Ecology ordered FHC to stop discharge of chromium plating wastes to the drywell. Ecology discovered chromium in the ground water at more than twice the drinking water standards and in soil and FHC building structures.

The selected remedial action for this site includes: excavation of 7,400 yd^3 of chromium contaminated soils exceeding 550 mg/kg with onsite treatment using chemical stabilization followed by onsite disposal of treatment residuals and placement of a final site cover; and demolition of the FHC building. The estimated present worth cost for this remedial action is $2,000,000.

PERFORMANCE STANDARDS OR GOALS: Currently, there are no standards for chromium in the soil. The site-specific determination made at the FHC site was to treat soils in excess of 550 mg/kg chromium. This determination was made relative to the drinking water standard which would be applicable in the future cleanup of ground water beneath the site.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARARs; Capping; Chromium; Debris; Direct Contact; Excavation; Flood Plain; Onsite Treatment; RCRA Alternate Closure; Soil; Solidification/Stabilization; State Criteria; Treatment Technology.

FRONTIER HARD CHROME, WA
Second Remedial Action - Final
July 5, 1988

ROD ABSTRACT

The Frontier Hard Chrome (FHC) site, covering approximately one-half acre, is located in the City of Vancouver, Washington. The areal ground water is used as the drinking water supply for the City of Vancouver, which has two well fields within one mile of the site. Since 1955, the site has primarily been occupied by two companies engaged in the chrome plating business. Pioneer Plating operated at the site from 1958 to 1970. The site was then occupied by FHC until 1983. Presently, the facility is being used as a storage and staging area for a neighboring business. During the operation of Pioneer and the initial operation of FHC, chromium plating wastes were discharged to the sanitary sewer system. In 1975, the City of Vancouver determined that the chromium in the wastewater from FHC was upsetting the operation of its new secondary treatment system. FHC was directed by the City and the Washington Department of Ecology (Ecology) to cease discharge to the sewer system until a treatment system was installed to remove the chromium waste. At that time, FHC began discharge of their untreated plating wastes to a dry well behind the facility. In 1976, Ecology permitted FHC to discharge to the dry well. Additionally, the permit contained a schedule for completion of a waste treatment system. Between 1976 and 1981, several extensions of the permit and schedule were granted, as the deadlines passed without compliance. In 1982, Ecology found FHC in violation of the Washington State Dangerous Waste Act for the illegal disposal of hazardous wastes, and in 1983 ordered FHC to stop discharging to the dry well. As a result, FHC also was required to prepare a plan for the investigation of the ground water. FHC closed down all operations at the site. The company did not undertake the investigation. In December 1987, EPA published a ROD for the site's first operable unit, which addressed the soil contamination. This second and final operable unit addresses chromium contaminated ground water.

The selected remedial action for this site includes: ground water pump and treatment using selective media ion exchange to remove chromium, followed by carbon adsorption to remove VOCs with discharge into the river or the city sanitary sewer; ground water monitoring; and implementation of institutional controls to restrict ground water usage and to control new well drilling. The estimated present worth cost for this remedy is $3,800,000.

PERFORMANCE STANDARDS OR GOALS: The selected remedy prevents public exposure to drinking water that exceeds MCLs for hexavalent chromium 0.05 mg/l, TCE 0.005 mg/l, and 1,1,1-trichloroethane 0.2 mg/l. Additionally, treated ground water will meet NPDES requirements, EPA Water Quality Criteria for protection of freshwater aquatic life, or city pretreatment requirements (depending on remedial action determinations for discharge).

INSTITUTIONAL CONTROLS: The use of ground water in and around the contaminated plume will be restricted. These restrictions will be designed to last until chromium levels reach drinking water standards.

FRONTIER HARD CHROME, WA
Second Remedial Action - Final
(Continued)

KEYWORDS: ARARs; Chromium; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Treatment; Inorganics; Institutional Controls; MCLs; Metals; O&M; Offsite Discharge; Onsite Treatment; RCRA; Safe Drinking Water Act; State Criteria; TCE; Water Quality Criteria; VOCs.

GOULD, OR
First Remedial Action
March 31, 1988

ROD ABSTRACT

The Gould site is located in a heavily industrial area of Portland, Oregon, approximately 1.3 miles southeast of St. John's Bridge. The site is contained in a 60-acre study area consisting of the Gould property and outlying areas containing battery casings and other residues from site operations. The area is sparsely populated and lies on the left bank floodplain of the Willamette River. Doane Lake, a small pond, is located adjacent to the site. The Gould site is mostly paved with asphalt, therefore, onsite flora and fauna are limited. Between 1949 and 1981, various owners operated the site as a secondary lead smelting facility specializing in lead-acid battery recycling, lead-smelting and refining, zinc alloying and casting, cable sweating, and lead oxide production. Operations ceased in August 1981; and by the summer of 1982 most of the structures, facilities, and equipment were removed. Remedial investigation and production records estimate that 86,900 tons of battery casings, 11,800 tons of matte, and 6,570,000 gallons of acid were disposed of at the site. Approximately 2% of the total volume of battery casings is located in surface piles, the remaining 98% is used as fill material, and is in direct contact with ground water. The primary contaminants of concern affecting the soil and sediments are lead and lead oxide. VOCs were discovered in ground water, but will be addressed in a future operable unit.

The selected remedial action for the soils unit at the site include: excavation of all battery casing fragments and matte from the Gould property and adjacent contaminated areas; a phased design program to determine the amount of material that can be recycled, and to minimize the amount of material that must be RCRA landfilled; separation of battery casing fragments; recycling of all applicable components; offsite disposal of nonrecyclable material failing the EP Toxicity test; onsite disposal of nonhazardous, nonrecyclable components; excavation, fixation/stabilization, and onsite disposal of remaining contaminated soil, sediments, and matte with soil capping and revegetation; isolation of surface water runoff to East Doane Lake by site regrading; and a monitoring program to determine changes in ground water contamination over time and to ensure that remediation does not adversely impact air quality. Additional ground and surface water studies will be performed to determine the need for remediation of the media. The estimated capital cost of this remedy is $3,491,603, assuming a "worst case" scenario where little of the material is recyclable, with present worth O&M of $17,073,581.

PERFORMANCE STANDARDS OR GOALS: Surface soils having a total lead content above 1000 mg/kg, and subsurface soils, matte, and East Doane Lake sediments failing the EP Toxicity test, will be fixated and disposed of onsite. Site boundaries will be monitored to determine if lead exceeds the NAAQs of 1.5 ug/m^3.

INSTITUTIONAL CONTROLS: The remedy will incorporate institutional controls; however, individual controls were not specified.

GOULD, OR
First Remedial Action
(Continued)

KEYWORDS: Acids, Air Monitoring; ARARs; Capping; Clean Air Act; Direct Contact; Excavation; Ground Water Monitoring; Interim Remedy; Lead; Metals; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; RCRA; Sediments; Soil; Solidification/Stabilization; Surface Water Monitoring; Treatment Technology.

MARTIN MARIETTA, OR
First Remedial Action - Final
September 29, 1988

ROD ABSTRACT

The 350-acre Martin Marietta Reduction Facility (MMRF) site is located in The Dalles, Wasco County, Oregon. The site lies within an 800-acre area used primarily for heavy industry and manufacturing; land not used for industrial processes is leased for agricultural purposes. Less than 20 homes and businesses are located in the area of the site. Ground water is an important source of water supply in The Dalles area for domestic, industrial and agricultural uses and flows in an easterly direction, toward the Columbia River. From 1958 to 1970, Harvey Aluminum, Inc. operated a processing facility designed to produce about 90,000 tons of aluminum a year. Martin Marietta Corporation (MMC) acquired the facility in 1970 and continued aluminum processing operations until 1984, when the plant was shut down. In 1986, MMC leased the plant and adjacent portions of the property to Northwest Aluminum Company, which resumed aluminum operations in 1987. The MMRF site consists of 28 areas of significant contamination resulting from treatment, storage, and disposal practices at the site. A 15-acre landfill located near the aluminum reduction building contains approximately 200,000 yd^3 of waste and plant construction debris. Leachate emanating from the landfill operations prior to the installation of a leachate collection system has resulted in the contamination of the area aquifer. Significant waste types in the landfill include asbestos, metallic wastes, and 5,000 tons of spent cathode waste materials containing cyanide, PAHs, and arsenic. In addition to the landfill, approximately 64,670 yd^3 of cathode waste material was deposited in areas referred to as the unloading area and the cathode waste management areas. And scrubber sludge ponds, consisting of 4 surface impoundments, two of which are covered with soil and vegetation, cover 14.8 acres and contain contaminated sludge and subsoil. The primary contaminants of concern affecting the soil, ground water, and debris are VOCs including TCE, organics including PAHs, inorganics including asbestos and cyanide, and metals including arsenic.

The selected remedial action for this site includes: excavation of the cathode waste material and placement into the existing landfill, and covering the landfill with a RCRA cap; placement of a soil cover over scrubber sludge ponds 2 and 3; plugging and abandonment of nearby production wells and connecting ground water users to the City of Dalles water supply system; collection and onsite treatment of leachate generated from the landfill, the perched water east of River Road and the cathode waste management areas, and the ground water in the unloading area using an aqueous treatment system with onsite discharge to a recycling pond; ground water monitoring; establishment of a contingency plan to perform additional recovery of ground water in the event further contamination is detected; and implementation of institutional controls. The estimated present worth cost for this remedial action is $6,707,400 with annual O&M of $144,000 for years 1-5 and $55,600 for years 6-30.

MARTIN MARIETTA, OR
First Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: Cleanup goals based on human health risks and the potential for contaminants leaching to ground water will be attained for soil and include arsenic 65 mg/kg (carcinogenic risk) and PAHs 175 mg/kg (urban background). Ground water ACLs including fluoride 9.7 mg/l and sulfate 3,020 mg/l were selected for portions of the aquifer where concentrations exceed the State of Oregon MCLs.

INSTITUTIONAL CONTROLS: Deed and well use restrictions will be implemented during and after remediation.

KEYWORDS: ACLs; Alternate Water Supply; ARARs; Arsenic; Asbestos; Capping; Carcinogenic Compounds; Contaminant; Debris; Deed Restrictions; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Landfill Closure; Leachate Collection/Treatment; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Public Exposure; RCRA; RCRA Closure Requirements; Safe Drinking Water Act; Soil; State Criteria; TCE; Venting; VOCs.

PACIFIC HIDE & FUR, ID
First Remedial Action - Final
June 28, 1988

ROD ABSTRACT

The Pacific Hide & Fur (PHF) site, consists of approximately 11-acres of fenced land, located in the northwest edge of Pocatello, Bannock County, Idaho. The site, a former gravel mining area, was purchased by McCarty's, Inc. (MI), a scrap metal dealer, in 1958. MI purchased scrap metal, batteries, drained transformers, and capacitors filled with PCB oils from various sources, storing them onsite in a previously excavated gravel pit. The waste is stored in the excavated pit, comprised of approximately three acres, for resale, reuse, or salvage. In August 1979, PHF purchased the rights to salvage scrap metal for four years. In the course of salvage operations, materials may have been moved from the pit. Also, PHF may have purchased scrap metals and transformers and stored them onsite. Records indicate that none of the new transformers purchased by PHF contained PCB oils. Transformers containing fluids were drained into site drums or into the pit. In January 1983, the U.S. EPA and the Idaho Department of Health and Welfare (IDHW) began investigating the site to determine whether disposal of PCB oils were occurring on or offsite due to operations at the metal facility. EPA declared the site to be an immediate threat to public health and welfare. As a result, approximately 593 PCB capacitors were transported offsite for incineration, and 21 hazardous materials drums and 30 cubic yards of soil were transported offsite for disposal. Additionally, 11 ground water wells and a security fence were installed at the site. The primary contaminants of concern affecting the soil are PCBs.

The selected remedial action for this site includes: excavation of soil to an average of 1.5 feet followed by screening to separate large contaminated materials and testing for further contamination; stabilization of a portion of the soil using an immobilization technique; construction of a bottom clay liner, where necessary; capping of the stabilized and remaining materials; removal of some ground water monitoring wells; ground water monitoring; and deed and access restrictions. If the fixation technology is found to be impracticable, onsite containment will be implemented as the final remedial action. The estimated present value of this remedial action ranges from $1,330,000 to $1,890,000. There is no O&M associated with this remedy.

PERFORMANCE STANDARDS OR GOALS: The soil cleanup goal for PCBs of 25 mg/kg by weight was established as the EPA cleanup policy for PCB spills, and corresponds with a 10^{-4} to 10^{-6} health-based risk level for the entire site (including hot spot areas).

INSTITUTIONAL CONTROLS: Deed restrictions to prohibit excavation or drilling will be developed consistent with final design determinations.

KEYWORDS: ARARs; Capping; Carcinogenic Compounds; Deed Restrictions; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Onsite Containment; Onsite Treatment; Organics; PCBs; Pilot Studies; RCRA; Soil; Solidification/Stabilization; Toxic Substances Control Act; Treatment Technology.

SECTION III

RECORDS OF DECISION SUMMARY TABLE

FY 1988

The FY 1988 Record of Decision (ROD) Summary Table provides an overview of site problems, selected remedies, cleanup criteria and estimated costs provided in the RODs signed during FY 1988. The table is presented by Region, in alphabetical order according to the site name.

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
I	Cannon Engineering Corporation, MA Industrial Facility	03/31/88	1st-Final	Soil, GW, and debris contaminated with VOCs including benzene, PCE and TCE, and organics including PAHs and PCBs	Not specified	Excavation and onsite treatment of soil contaminated with VOCs using thermal aeration, and excavation and offsite treatment of soil contaminated with PCBs; implementation of a wetland restoration program; decontamination and removal of buildings, tanks, and structures; additional soil sampling; access restrictions; GW monitoring with implementation of a water quality monitoring program; and institutional controls	Soil cleanup levels were based on leaching potential into GW as determined using the Organic Leaching Model and include benzene 550 ug/kg and TCE 71 ug/kg. The soil cleanup level for PCBs 9 mg/kg is based on risk levels. GW cleanup levels are the MCLs for benzene 5 ug/l, TCE 5 ug/l, and vinyl chloride 2 ug/l	$3,411,000 - 4,505,000 (present worth) $700,000 (present worth O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
I	Charles George Reclamation Landfill, MA 70-Acre Landfill	09/29/88	3rd and 4th Final	Sediments, GW, and air contaminated with VOCs including benzene, TCE, and PCE, organics including PAHs, and metals including arsenic	500 yd^3	GW pump and treatment along with collected leachate using biological treatment, metals precipitation, and carbon adsorption, followed by onsite discharge to GW; GW and residential well monitoring; collection and incineration of landfill vent gas emissions; excavation and solidification of sediments with onsite disposal in landfill	GW cleanup will meet individual target levels based on MCLs including benzene 5 ug/l, arsenic 50 ug/l, and TCE 5 ug/l. Discharge concentration levels were provided for 18 contaminants. Sediments will meet the target cleanup level for PAHs of 1.0 mg/kg based on a risk level of 4×10^{-6}. Vent emissions will be treated to a cumulative risk level of 1×10^{-6}. Individual target levels for vent emissions were provided for 12 contaminants including benzene 568 ug/m^3, TCE 3,210 ug/m^3, and PCE 8,690 ug/m^3	$11,320,000 (present worth) $773,000 (annual O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
I	Groveland Wells, MA Industrial Facility	09/30/88	1st	Soil, sediments, GW, and SW contaminated with VOCs including PCE and TCE, and metals including arsenic and lead	20,000 yd^3 (soil)	In situ vacuum extraction followed by carbon adsorption treatment of contaminated soil; GW pump and treatment using air stripping and carbon adsorption with reinjection to the aquifer; GW monitoring; and sealing or disconnecting all drains and lines to the subsurface disposal system	GW cleanup levels for VOCs are based on MCLs or a 10^{-6} cancer risk level, and cleanup levels for metals are based on State Ground Water Quality Standards and permit requirements. Individual goals include PCE 5.0 ug/l, TCE 5.0 ug/l (MCL), arsenic 50 ug/l, and lead 50 ug/l. Soil cleanup goals for VOCs were based on achieving the target GW levels and include PCE 18.2 ug/kg and TCE 6.3 ug/kg	$4,165,000 (present worth) $2,677,000 (present worth O&M)
I	Iron Horse Park, MA Industrial Facility	09/15/88	1st	Soil, sludge, and debris contaminated with VOCs, organics including PAHs, and metals including arsenic and lead	28,000 yd^3 (soil and sludge)	Excavation and biodegradation of contaminated soil and sludge with residual disposal to the lagoon area, followed by constructing a clean soil cover and revegetation; and decontamination of the lagoon system's piping and pumps	Treatment of soil and sludge will attain a 10^{-6} excess cancer risk for industrial use of the area, and 10^{-5} excess cancer risk for residential use of the area. Treatment should reduce contaminant concentration in wastes 70-80%, and will meet the state pathogen reduction requirements for sludge. Individual cleanup goals were not specified	$2,273,000 (capital) $47,000 (present worth O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
I	Keefe Environmental Services, NH Waste Disposal Facility	03/21/88	2nd-Final	Soil and GW contaminated with VOCs including PCE and TCE	150,000 ft^2 (soil area)	In situ treatment of soil using vacuum extraction with discharge to the atmosphere; and GW pump and treatment using air stripping, filtration, and carbon adsorption with discharge to a GW recharge area along site border (adjacent to wetland)	Cumulative soil cleanup goals will attain a 5.7×10^{-5} cancer risk level. Individual goals include benzene 20.8 ug/kg, PCE 91 ug/kg, TCE 31.5 ug/kg, 1,2-dichloroethane 3.5 ug/kg, and 1,1-dichloroethylene 22.8 ug/kg. GW will meet MCL values which include benzene 5 ug/l, PCE 5 ug/l, TCE 5 ug/l, 1,2-dichloroethane 5 ug/l, and 1,1-dichloroethylene 7 ug/l	$1,937,300 (capital) $4,157,700 (present worth O&M)
I	Landfill and Resource Recovery, RI 28-Acre Industrial/ Municipal Landfill	09/29/88	1st-Final	Air contaminated with VOCs including benzene, toluene, PCE, and TCE	Not specified	Upgrading the landfill by slope stabilization, installation of a RCRA cap, and revegetation; collection and thermal destruction (method to be determined in design) of landfill gases; excavation of eroded landfill sand from wetlands, with replacement onsite, and vegetation of excavated wetland areas; access restrictions; and GW and air monitoring	Target cleanup levels for the gaseous emissions are the State Air Toxic Regulations. Individual goals were not specified	$5,674,000 - $6,790,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
I	Laurel Park, CT 19-Acre Industrial Landfill	06/30/88	1st-Final	Soil, sediments, GW, and SW contaminated with VOCs, organics, and metals	1,300,000 yd^3	Installation of a RCRA cap over all waste disposal areas; rehabilitation of existing leachate collection system supplemented by a shallow GW extraction system consisting of a french drain and/or GW extraction wells with discharge and offsite treatment at NWPCF; and monitoring of all media	GW and leachate will be extracted to meet the RCRA Ground Water Protection Standard (GWPS) at the point of compliance, which is the vertical surface at the hydraulically downgradient limit of the waste management area. Currently, the GWPS are set at MCLs, ACLs, or background. Individual cleanup levels were not specified	$21,706,300 (present worth) or $23,078,200 (including pretreatment, if necessary) (present worth)
I	Old Springfield Landfill, VT 27-Acre Industrial/ Municipal Landfill	09/22/88	1st	GW contaminated with VOCs including benzene, TCE, DCE, and vinyl chloride, and other organics including PCBs and PAHs		GW extraction and leachate collection with combined treatment onsite or discharge to a POTW; institutional controls; multimedia monitoring; and additional site studies	GW and leachate cleanup goals will attain MCLs and include benzene 5 ug/l, TCE 5 ug/l, DCE 7 ug/l, and vinyl chloride 2 ug/l	$5,374,000 (present worth) $173,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
I	Rose Disposal Pit, MA Waste Disposal Area	09/23/88	1st-Final	Soil, sediments, GW and SW contaminated with VOCs including benzene, PCE, TCE, toluene and xylenes, and PCBs	60,000 yd^3 (soil)	Excavation and onsite incineration of 15,000 yd^3 of soil and sediment with residual disposal onsite; GW pump and treatment along with SW using air stripping and carbon adsorption with discharge to the aquifer; and institutional controls	Soil with PCBs in excess of 13 mg/kg (based on a 10^{-5} risk level) will be incinerated to a concentration less than 2 mg/kg for PCBs. GW cleanup goals are set at or below MCLs, if available, MCLGs, Lifetime Health Advisory (LHA) or a 10^{-6} cancer risk level. Individual GW goals include TCE (MCL), benzene (MCL), and PCE 1 ug/l (10^{-6} risk level)	$6,450,000 (present worth) $5,790,000 (present worth O&M)
I	Yaworski Lagoon, CT Waste Disposal Area	09/29/88	1st-Final	Soil, sediments, GW and debris contaminated with VOCs including benzene, toluene, and xylenes, organics including PAHs, and metals including chromium and lead	65,000 yd^3 (sludge) 60,000 yd^3 (debris)	Installation of a RCRA cap over lagoon area; reconstruction of lagoon dike to improve flood control; GW monitoring; and GW treatment with method to be established as part of corrective action program, if necessary	GW cleanup levels will meet ACLs established as part of the selected remedy. Individual ACLs were not specified	$1,673,000 (capital) $716,000 (present worth O&M)
II	American Thermostat, NY Industrial Facility	01/07/88	1st	GW contaminated with VOCs including PCE and TCE	Not specified	Extension of the existing Catskill Water District pipeline to affected and potentially affected areas; the contaminated GW and surrounding areas will be cleaned up by the owner of the property	GW cleanup goals will meet MCLs for TCE 0.005 mg/l, 1,1-dichloroethylene 0.007 mg/l, and 1,1-trichloroethane 0.200 mg/l, and the Water Quality Criteria chronic level for PCE 0.800 mg/l	$2,270,000 - $2,380,000 (capital) $100,000 - $110,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Asbestos Dump, NJ Industrial Facility	09/30/88	1st	Soil and GW contaminated with asbestos	90,000 yd^3 (asbestos waste)	Installation of a soil cover; construction of slope protection/ stabilization measures along asbestos mound embankment, and surface runoff diversion channels; GW monitoring; institutional controls restricting GW usage and land development; access restrictions; and treatability studies to evaluate technologies that may permanently remediate asbestos	Remedy addresses containment of asbestos, thus individual cleanup goals are not applicable	$1,145,000 (present worth) $56,000 - $161,000 (annual O&M)
II	Beachwood/ Berkeley Wells, NJ Residential Plumbing System	06/30/88	1st-Final	Drinking water contaminated with lead	Not specified	No man-made or industrial contaminant source is causing the elevated lead levels in drinking water. Remediation under the Superfund program is precluded by law. The State of New Jersey is proceeding independently to address the problem	Not applicable	$0

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Brewster Well Field, NY Municipal Well Field	09/29/88	2nd-Final	Soils, sediments, sludge, and debris contaminated with VOCs including PCE and TCE	100 yd^3	Excavation and offsite incineration of drywell sediments, sludge and soil with greater than 4 mg/kg PCE, followed by offsite disposal; and removal, decontamination and offsite disposal of the concrete drywell structure and debris	Remediation of all soil, sediments, sludge and debris containing greater than 4 mg/kg PCE will reduce health risks due to direct contact with contaminated site soils to 1×10^{-6}	$241,940 (capital)
II	Burnt Fly Bog, NJ Industrial Waste Disposal Area/Municipal Landfill	09/29/88	2nd	Soil, sediments, and SW contaminated with PCBs and lead	82,000 yd^3 (soil and sediments)	Excavation and offsite disposal of approximately 5,600 yd^3 of contaminated downstream sediments; containment through a sedimentation basin and diversion controls of remaining contaminated soil and sediments; access restrictions; and performance of treatability studies to determine final treatment for contained contaminated soil and sediments	Remedy is an interim action designed to control contaminant migration pending treatability study results. Cleanup goals for the downstream sediments will meet the State soil cleanup criteria of PCBs 5 mg/kg and lead 250 mg/kg	$3,000,000 (present worth for three-year life) $6,100,000 (present worth for 20-year life) $320,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Ewan Property, NJ Illegal Waste Disposal/ Dumping Area	09/29/88	1st	Soil contaminated with VOCs including benzene, TCE, PCE, and xylenes, and metals including chromium and lead	500–8,000 drums 4,500 yd^3 (heavily contaminated soil and drum contents) 29,500 yd^3 (moderately contaminated soil and drum contents)	Excavation and offsite incineration of approximately 4,500 yd^3 of contaminated soil/waste; additional assessment of non-incinerable waste to determine the appropriate remediation; and GW and air monitoring	Final cleanup goals will be determined during a subsequent operable unit	$21,153,000 (present worth) $22,000 (annual O&M)
II	GE Wiring Devices, PR Industrial Facility	09/30/88	1st-Final	Soil, perched GW, and debris contaminated with mercury	1,500 yd^3 (soil) 500,000 gals (perched GW) 4,000 yd^3 (debris)	Onsite hydrometallurgical treatment of the soil, perched GW, and waste-fill materials with residue disposed of in the former waste-fill area, followed by covering with a clean soil cover and onsite treatment of the leaching agent with residual discharge to POTW; additional investigation of the GW to determine extent of contamination; and limited GW monitoring, if GW remediation is not required	Soil, perched GW, and waste-fill material will be treated to either 16 ppm, if further air sampling verifies levels exceeding the EPA National Emission Standard for a Hazardous Material (NESHAP), or 21 ppm based on risk due to ingestion, if there are no levels exceeding NESHAP	$1,912,870 (capital) $0 (O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Kin-Buc Landfill, NJ 220-Acre Municipal/ Industrial Landfill	09/30/88	1st	Sediments, GW, SW, and air contaminated with VOCs including benzene and toluene, organics including PAHs, and PCBs, and metals including arsenic and lead	3,000,000 gals (oily-phase leachate) 1,000,000 tons (solid waste)	Installation of a slurry wall surrounding the site, RCRA capping over Kin-Buc II, portions of the low-lying area between Kin-Buc I and the Edison Landfill, and Pool C, as well as maintenance, and upgrading if necessary, of Kin-Buc I cap; collection of oily-phase leachate with offsite incineration and residual disposal; collection and onsite treatment of aqueous-phase leachate and contaminated GW with discharge either to SW or POTW; and GW monitoring	Incineration of oily-phase leachate will meet six nines (99.9999%) destruction and removal efficiency. Aqueous-phase leachate and contaminated GW discharge criteria will be established by NJDEP following treatability studies, but will meet NJAC water quality criteria and state wastewater discharge requirements. Individual cleanup goals were not specified	$16,635,000 - $16,290,000 (present worth) Annual O&M varies from $848,000 (year 1) to $405,000 (years 12-30)
II	Lipari Landfill, NJ 6-Acre Industrial/ Municipal Landfill	07/11/88	3rd-Final	Soil, sediments, GW, SW and air contaminated with VOCs including benzene, toluene, and xylenes, and metals including arsenic, chromium, and lead	Not specified	GW/leachate pump and onsite treatment with discharge to POTW; marsh soil excavation and thermal treatment with offsite disposal; sediment dredging, dewatering and thermal treatment with offsite disposal; temporary measures, if necessary, to reduce volatile emissions; and integration of offsite sampling with onsite monitoring plan	Soil cleanup will attain New Jersey soil cleanup objectives and health or real-based criteria. SW cleanup will meet Federal Water Quality Criteria and State surface water standards. Individual goals were not provided	$21,000,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Love Canal, NY Waste Disposal Facility	10/26/87	2nd	Sediments and debris contaminated with dioxin	30,000 - 40,900 yd^3	Construction of an onsite dewatering/containment facility (DCF) and a separate construction/demolition debris facility (CDF); onsite containment of sewer and creek sediments in the DCF prior to thermal destruction in a transportable thermal destruction unit; onsite storage in the DCF of leachate treatment residuals and other "associated" material generated as a result of remediation; and onsite storage of uncontaminated debris in the CDF	The CDC level of 1 ug/kg for dioxin in residential soils is not implementable and would lead to unacceptable project delays. Additionally, the community is opposed to anything less than complete thermal destruction. As a result, all materials (excluding 5,500 yd^3 of house debris) will be thermally destroyed. Six nines (99.9999%) destruction and removal efficiency will be the goal. Excavation to approximately 18 inches will ensure elimination or reduction of risk	$26,400,000 - $31,400,000 (present worth)
II	Love Canal/93rd Street School, NY Waste Disposal Area	09/26/88	3rd	Soil contaminated with VOCs including toluene and xylenes, organics including dioxins, PAHs, and pesticides, and metals including arsenic and lead.	7,500 yd^3	Excavation and solidification or stabilization of contaminated soil; replacement of solidified soil into excavation; installation of a RCRA cap; and sampling, analysis, and monitoring of GW	Soil cleanup will meet the Land Disposal Restrictions requirements for dioxin of less than 1 ug/l using the TCLP test	$2,295,000 - $3,675,000 (capital) $121,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Ludlow Sand and Gravel, NY Landfill	09/30/88	1st-Final	Soil, sediments, and GW contaminated with VOCs and organics including PCBs and phenols	10,000 yd^3 (soil and sediment)	Consolidation and disposal in the onsite landfill of contaminated soil and sediments, followed by RCRA capping; leachate/GW collection and dewatering of the landfill with onsite treatment and offsite residual discharge; hydraulic containment of the landfill through implementation of upgradient GW controls; deed and access restrictions; and long-term water quality monitoring including GW, SW, and potable water supply wells	Leachate/GW cleanup will attain substantive requirements of State Pollution Discharge Elimination System, Technical Operations Guidance Series, Ambient Water Quality Standards and Guidance Values, all GW and SW standards, and State Freshwater Wetlands Standards. Soil cleanup will attain 10 mg/kg for PCBs based on TSCA policy	$3,727,200 - $14,548,900 (present worth) $58,900 - $364,900 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Marathon Battery Company, NJ Industrial Facility	09/30/88	2nd	Soil, sediments, GW, and debris contaminated with VOCs including PCE and TCE, and metals including cadmium and nickel	6,100 yd^3 (soil) 5,000 yd^3 (sediment) 110 yd^3 (dust)	Decontamination of the inside surfaces and contents of the former battery facility, and excavation of cadmium-contaminated soil and the dredge spoils vault, followed by onsite fixation of the excavated soil, dust and vault sediments with offsite disposal, and backfilling excavated areas; excavating the VOC - contaminated soil hotspots, followed by enhanced volatilization and replacement of the clean residuals onsite; GW monitoring; institutional controls; and evaluation and performance of repairs, if needed, to the inoperable sprinkler and heating systems inside the former battery facility	ACLs are provided as GW cleanup goals for indicator compounds. The ACLs are below Federal and State MCLs, if available, and include PCE 0 ug/l and TEC 3 ug/l. These goals will be attained in 3-10 years by natural attenuation. Excavation of cadmium-contaminated soil will attain an ATSDR-recommended level of 20 mg/kg	$10,010,000 (present worth) $775,000 (annual O&M year 1) $17,000 (annual O&M years 2-30)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Montgomery Township Housing Development, NJ Residential Area	06/30/88	2nd-Final	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment onsite using air stripping with reinjection into the aquifer; connecting remaining affected residences to public water supply, and sealing remaining private water supply and monitoring wells within plume; and GW monitoring	GW cleanup will meet the State MCL for TCE of 1.0 ug/l	$2,548,000 (present worth) $94,000 (annual O&M)
II	Nascolite, NJ Industrial Facility	03/31/88	1st	Soil, GW, and debris contaminated with VOCs and organics	Not specified	GW pump and treatment using a method to be determined after pilot testing, followed by reinjection; performance of additional soil and onsite building studies to determine future measures; and provision of an alternate water supply for potentially affected residents	ROD did not specify chemical-specific goals but indicated attainment of CWA, SDWA, SWDA, NJSDWA, and NJWQC. Additionally, carcinogenic compounds without cleanup standards will attain the 10^{-6} health-based risk level. Any other contaminants will attain the goal of 5 ug/l individually and 50 ug/l total noncarcinogenic and "non-a-280" compounds	$609,000 (capital) $266,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Old Bethpage, NY 65-Acre Municipal/ Industrial Landfill	03/17/88	1st-Final	GW contaminated with VOCs including TCE, benzene, and toluene, and metals including chromium and lead; air contaminated with methane gas and VOCs	Not specified	GW pump and treatment using air stripping and, if necessary, carbon filtration with discharge into an upgradient injection well system; hydraulic control of the plume through installation of GW recovery wells; GW monitoring; completion of the landfill capping (29 acres previously capped); continuation and expansion, or enhancement, of the leachate control and gas collection systems; and gas monitoring	The plume will be treated to State standards or to a zero-slope condition if one exists following 5 or more years of pumping. Individual goals include chromium 0.05 mg/l, lead 0.025 mg/l, TCE 5.0 mg/l (MCL), benzene non-detectable, and toluene 50 mg/l. Air discharge requirements also will meet State standards. Individual goals include methylene chloride 1.17×10^3 ug/m^3, TCE 9.0×10^2 ug/m^3, benzene 1.0×10^2 ug/m^3, and toluene 7.5×10^3 ug/m^3	$23,045,000 (present worth)
II	Reich Farm, NJ Illegal Waste Disposal Area	09/30/88	1st-Final	Soil and GW contaminated with VOCs including PCE, toluene, TCE and xylenes, and organics	2,010 yd^3	Soil excavation and onsite treatment through enhanced volatilization and onsite disposal and/or offsite incineration and disposal; GW pump and treatment onsite using air stripping and carbon adsorption with reinjection to the aquifer; and additional GW and soil sampling	GW will be treated to attain State MCLs for TCA 26 ug/l, TCE 1 ug/l, and PCE 1 ug/l. Soil cleanup levels will meet State Soil Action Levels of total VOCs 1 mg/kg and total semi-volatile organics 10 mg/kg	$5,832,000 (present worth) $419,550 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Ringwood Mines/Landfill, NJ Waste Disposal Area/ Landfill	09/29/88	1st-Final	Soil and GW contaminated with metals including arsenic and lead, and petroleum hydrocarbons	Not specified	Soil sampling and excavation, if necessary, with offsite disposal, backfilling, regrading, and revegetation; and GW and SW monitoring	Soil cleanup will attain the non-promulgated New Jersey Cleanup Objectives for lead 250 mg/kg and total petroleum hydrocarbons 100 mg/kg. GW will attain MCLs, including arsenic 50 ug/l and lead 50 ug/l, by natural attenuation	$225,000 (capital) $50,000 (annual O&M)
II	Rocky Hill, NJ Municipal Well Field	06/30/88	1st-Final	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping with reinjection; alternate water supply; sealing remaining wells; and GW monitoring	Remediation will meet a 0.12×10^{-6} excess cancer risk level. The TCE cleanup goal of 1 ug/l corresponds to the proposed NJ MCL. PCE and 1,1-dichloroethane will be reduced to below 1 ug/l and 2 ug/l, respectively	$1,618,000 (capital) $84,000 (annual O&M)
II	Tabernacle, NJ Waste Disposal Area	06/30/88	1st-Final	GW contaminated with VOCs including 1,1,1-TCA and DCE	Not specified	Installation of GW monitoring wells with implementation of a monitoring program to delineate extent of plume; GW treatment using air stripping followed by reinjection; exhaust gas analysis; and soil sampling of former drum dumping and storage area	The proposed MCLs established by NJDEP are more stringent than Federal standards and include 1,1,1-TCA 26 ug/l and DCE 2 ug/l. The remedial action will comply with the NJDEP levels in anticipation that they will become State ARARs	$772,600 (capital) $215,600 (present worth O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
II	Upjohn Manufacturing Company, PR Industrial Facility	09/30/88	1st-Final	GW contaminated with carbon tetrachloride	Not specified	GW pump and treatment using air stripping with discharge to either a GW recharge area or a public water supply system; installation of chloride monitoring wells near the coastline; and GW monitoring	GW cleanup levels will meet the MCL for carbon tetrachloride 5 ug/l	$2,200,000 - 6,200,000 (capital) $400,000 - 700,000 (annual O&M)
II	York Oil, NY Waste Oil Recycling Facility	02/09/88	1st	Soil, sediments, GW, and SW contaminated with VOCs, metals, and organics including PCBs	30,000 yd^3 (soil) 8,000 yd^3 (sediments) 25,000 gals (tank contents)	Excavation and onsite solidification of soils and sediments followed by onsite disposal of treatment residuals; installation of draw down wells to collect sinking plume and oil followed by onsite oil skimmer and oil/water separator treatment with subsequent offsite discharge; offsite thermal treatment of tank oils in addition to other soils collected at the site; cleaning and demolition of empty storage tanks; and surface grading	GW cleanup will attain the State GW ARAR for any single phenolic compound 50 ug/l and for total phenolics 100 ug/l	$6,500,000 (capital) $500,000 (present worth O&M)
III	Aladdin Plating, PA Industrial Facility	09/27/88	1st	Soil contaminated with metals including chromium	12,000 yd^3	Excavation and offsite stabilization of contaminated soil, followed by offsite disposal in a landfill; and replacement of the excavated soil with clean fill	Soil cleanup will attain a level of chromium 50 mg/kg	$4,461,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Ambler Asbestos Piles, PA Industrial Facility	09/30/88	1st	Sediments, SW, and debris contaminated with asbestos	4,500 yd^3 (sediments) 1,900,000 gals (SW) 1,255,000 yd^3 (debris)	Installation of a geotextile and soil cover over exposed areas of waste piles; erosion control/repair; vegetative/soil cover over both waste piles; runoff collection and treatment; pump and filter lagoon and basins water, followed by onsite discharge, backfilling lagoon and basins, and onsite disposal of collected sediments and asbestos onto the waste piles; slope stability control measures, if necessary after testing; further alternative evaluations; and access restrictions	Remedy addresses containment of asbestos-contaminated debris, therefore, no cleanup level is provided for the debris. SW treatment will meet requirements of State NPDES. Individual cleanup goal not specified	$5,135,000 (capital) $46,000 - $63,000 (years 2-6) $33,000 (years 7-30)
III	Avtex Fibers, VA Industrial Facility	09/30/88	1st	GW is contaminated with organics including phenols and metals including arsenic and lead	Not specified	GW pump and treatment and basin liquid treatment after upgrading the existing onsite activated sludge treatment plant; GW, SW, and basin fluids monitoring; and deed restrictions	GW will be treated to meet MCLs, EPA Reference dose-based water limits, AWQC, State drinking water standards, NPDES requirements and Federal and State WQC. Individual cleanup goals include phenol 0.3 mg/l (AWQC), lead 0.05 mg/l (MCL/VAGWS), and arsenic 0.05 mg/l (MCL/VAGWS)	$9,122,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Bendix, PA Industrial Facility	09/30/88	1st-Final	Soil and GW contaminated with VOCs including TCE	Not specified	Soil vacuum extraction and soil aeration; and GW pump and treatment onsite with offsite GW treated at each residential wellhead	GW cleanup will attain a TCE concentration level of less than 1 ug/l both on- and offsite. Soil cleanup will meet a concentration limit of VOCs 100 ug/kg based on GW cleanup goal	$4,487,000 (present worth) $394,000 (annual O&M)
III	Berks Sand Pit, PA Waste Disposal Area	09/29/88	1st-Final	Sediments, SW and GW contaminated with VOCs including PCE, 1,1-DCE and 1,1,1-TCA	Not specified	Excavation of contaminated sediments with offsite incineration and disposal; GW pump and treatment using air stripping and vapor phase carbon adsorption, followed by reinjection to the aquifer; provision of an alternate water supply system; GW and SW monitoring; and deed restrictions	GW cleanup levels will meet MCLs for 1,1-DCE 7 ug/l and 1,1,1-TCA 200 ug/l. Secondary target levels of 1,1-DCE 1 ug/l and PCE 1 ug/l are based on Unit Cancer Risk. GW cleanup will also meet the Underground Injection Control Regulations	$10,773,100 (present worth) $459,200 (annual O&M)
III	Chisman Creek, VA Waste Disposal Area	03/31/88	2nd-Final	SW contaminated with metals including nickel and vanadium	Not specified	Diversion of surface runoff from Area A (previously capped) into Pond A; and water quality monitoring	There is no ARAR promulgated for vanadium; however, an unpublished Estimated Advisory Concentration for vanadium of 7.7 ug/l will be met in fresh water systems. Remediation will attain the Clean Water Act level for nickel 13.4 mg/kg	$137,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Delaware Sand and Gravel, DE 27-Acre Industrial Landfill	04/22/88	1st-Final	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes, organics including PCBs, PAHs, and phenols, and metals including chromium and lead	535,000 yd^3 (soil)	Excavation and onsite incineration of approximately 36,000 tons of contaminated soil and waste from the Drum Disposal and Ridge areas, followed by residual ash disposal offsite, grading, and revegetation of excavated areas; removal and offsite disposal of surface debris from the Inert area, followed by capping; construction of a RCRA cap over the Grantham South area; GW pump and treatment with offsite discharge; and GW monitoring	GW cleanup levels will attain 10^{-6} risk levels or MCLs at the site boundary, and meet NPDES requirements for SW discharge. Individual GW cleanup levels were not specified. Soil cleanup levels were based on acceptable drinking water exposure levels and include toluene 6,000 mg/kg, xylene 4.8 mg/kg, and phenol 497 mg/kg	$24,994,000 (present worth)
III	Dorney Road Landfill, PA 27-Acre Municipal Landfill	09/29/88	1st	Soil and SW contaminated with VOCs, organics and inorganics	700,000 gals	Offsite disposal of ponded water; regrading and installation of a multi-layer cap; runon/runoff controls; runoff and GW monitoring; and access and deed restrictions	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable. Cancer risk levels onsite will be reduced to below 10^{-6}	$14,000,000 (present worth) $42,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Douglassville Disposal, PA Waste Recycling and Processing Facility	06/24/88	2nd	Buildings, tanks, piping, and process equipment contaminated with VOCs, organics including PCBs and PAHs, and metals including lead	200,000 gals (tank contents)	Removal, transportation, and offsite incineration of liquid and sludge tank waste; decontamination of tanks, piping, processing equipment, and building materials; offsite disposal of building rubble; selling of tanks and other metal materials as scrap; offsite disposal of concrete, asphalt, and other materials; and treatment of generated decontamination fluids, as appropriate	Tasks, piping, processing equipment, and building materials designated for salvage or reuse will be decontaminated to a level not to exceed 100 ug/100 cm^2 PCBs on the surface. Concrete, asphalt, and other materials, which contain PCBs and cannot be decontaminated to less than 50 mg/kg PCBs, will be disposed of at an offsite hazardous waste landfill. This operable unit does not attempt to ensure compliance with all ARARs for the entire site, but will not be inconsistent with a final comprehensive remedy for the site	$4,050,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Drake Chemical, PA Industrial Facility	09/29/88	3rd-Final	Soil, sediments, GW, and SW contaminated with VOCs including benzene, toluene, TCE, and xylenes, organics including PAHs and phenols, and metals including arsenic, chromium and lead	252,000 yd^3 (soil, sediments, and sludge)	Excavation of soil, sediments and sludge, followed by onsite incineration, backfilling (possibly using incinerator ash), and installation of vegetation cover; GW pump and treatment along with SW, aqueous wastes from the leachate lagoon area, and runon, after construction of an onsite biological activated carbon treatment plant, followed by offsite discharge to a stream or POTW; GW monitoring; and flood control measures	GW cleanup levels will attain an overall risk level of 10^{-5} by meeting MCLs or MCLGs. Individual cleanup goals were not specified	$97,363,000 (present worth) $787,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Fike Chemical, WV Industrial Facility	09/29/88	1st	Soil, GW, and SW contaminated with VOCs, organics including PCBs and methyl mercaptan, inorganics including acids, asbestos, cyanide, and metals	600,000 gals (SW) 750,000 gals (tank contents) 2,800 drums (liquid waste) 100,000 lbs (200 drums of metallic sodium)	Removal and offsite incineration of the tank containing methyl mercaptan and the drums of metallic sodium, followed by offsite disposal; removal, bulking, and offsite treatment and disposal of drums on the ground surface and of the materials found in various tanks, lines, and vessels (using incineration, ion exchange or chemical oxidation, and stabilization/fixation depending on contents); lab packing of laboratory containers with either offsite disposal or offsite incineration; drainage and stabilization of lagoon and sewage treatment ponds, followed by treatment and offsite residual discharge; excavation and offsite disposal of buried drums; and stabilization and/or removal of asbestos-containing insulation	Remedy addreses the control, stabilization, and elimination of the imminent hazards associated with the site to allow for the completion of the RI/FS process. Lagoon liquids will meet NPDES permit requirements. Individual goals were not specified	$8,000,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Henderson Road, PA Waste Disposal Facility	03/30/88	1st	Potential offsite GW contamination from VOCs and organics	Not specified	Extraction of onsite and downgradient (if necessary) GW and treatment using air stripping with probable discharge to adjacent stream and possible reinjection of a portion of the GW near the injection well as part of unsaturated zone treatment; closure of the injection well; excavation of contaminated oil pit sediments and removal of significant waste, if feasible, directly out of the injection well; installation, operation, and maintenance of a carbon adsorption water treatment system at affected offsite active well; deed restrictions; GW monitoring; pilot study testing of in-situ volatilization (ISV) or other technology in the unsaturated zone; and periodic reevaluation of cleanup goals	GW cleanup will attain a 7×10^{-4} cancer risk level. Complete aquifer restoration not considered feasible due to background contamination. Individual cleanup goals provided for 46 chemicals	$5,500,000 (without ISV) (present worth) or $12,200,000 (with ISV) (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Kimberton, PA Industrial Facility	09/30/88	1st	GW contaminated with VOCs including TCE	Not specified	Interim remedy selects no further action with continued GW monitoring and treatment at residential and commercial establishments by filtration using granular activated carbon adsorption	GW treatment will attain a 10^{-6} risk level for VOCs. The use of GAC filters on impacted wells has reduced contaminants of concern to non-detectable levels	$3,850,000 (present worth) $250,000 - $300,000 (annual O&M)
III	L.A. Clarke and Son, VA Industrial Facility	03/31/88	1st	Soil and sediments contaminated with constituents of creosote including PNAs and benzene	118,000 yd^3	In situ soil flushing of subsurface soils followed by in situ biodegradation; onsite land farming of excavated surface soils, sediments, and subsurface wetland soils; biological degradation of creosote contaminated bottom sediment; excavation/dredging and consolidation of nontreated contaminated sediments, subsurface wetland soils, buried pit materials and remaining surface soils; erosion sedimentation control; backfilling of excavated areas with treated soil and sediments and addition of topsoil for revegetation; and GW monitoring	Soil cleanup levels will attain a cumulative 10^{-5} cancer risk level. Individual goals include carcinogenic PNAs 10.3 mg/kg and benzene 94.03 mg/kg	$23,375,000 (capital) $33,900 (present worth O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Middletown Airfield, PA Federal Facility	12/31/87	1st	GW contaminated with VOCs including PCE and TCE	Not specified	Provision of a potable water supply; construction of a central treatment plant; and GW pump and treatment using air stripping	GW cleanup levels will meet a cumulative 10^{-6} cancer risk level for PCE 1.0 ug/l, and MCLs for TCE 5.0 ug/l, benzene 5.0 ug/l, and toluene 2,000 ug/l (MCLG)	$3,750,000 (capital) $160,000 (annual O&M)
III	New Castle, DE Waste Disposal Facility	03/31/88	1st-Final	None	None	No action with SW monitoring until deletion from NPL and implementation of State Closure	Concentrations of lead, cadmium, and chromium are below levels established as MCLs	$0
III	Ordnance Works Disposal, WV Waste Disposal Area	03/31/88	1st	Soil and sediments contaminated with metals including arsenic, and organics including PAHs and PCBs	Not specified	Consolidation of existing landfill waste and application of a multi-layer RCRA cap; excavation and onsite incineration of lagoon area and scraped-area soils and impacted stream sediments with onsite disposal of treatment residuals in the landfill prior to capping (assuming the ash is not EP toxic); placement of clean fill in the excavated area, followed by grading and revegetation; implementation of surface management techniques for drainage and sediment control in the landfill area; and ambient air and post-treatment monitoring	Risk-based cleanup levels for indicator chemicals were developed for arsenic 20 mg/kg, PAHs 26 mg/kg, and mercury 175 mg/kg. A PCB cleanup level of 5 mg/kg was used based on EPA cleanup goals for industrial sites	$6,718,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Palmerton Zinc, PA Industrial Facility/Zinc Smelter	06/29/88	2nd	Sediments, GW, and SW contaminated with metals including cadmium, lead, and zinc	27,500,000 tons (smelter process residues)	Slope modification, capping, and application of a vegetation cover on the residue bank; construction of SW diversion channels; SW/leachate collection and treatment using lime-activated filtration lagoons and/or constructed wetlands; implementation of an inspection, monitoring, and maintenance plan; and wetlands restorative measures, if necessary	SW/leachate treatment levels will meet CWA requirements and attain SW background levels. Individual goals were not specified	>$2,861,000 (present worth) (exact figure to be determined during design)
III	Rhinehart Tire Fire, VA Waste Disposal Facility	06/30/88	1st	Soil, GW and SW contaminated with metals including arsenic, lead and zinc	Not specified	Collection and gravity settling of surface water runoff; collection, oil-water separation and transport to POTW of shallow GW oily seeps; increased freeboard in existing onsite ponds; and soil erosion control	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$1,332,340 (present worth) $145,000 (O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Southern MD Wood Treating, MD Wood Preserving Facility	06/29/88	1st-Final	Soil, sediments, SW, GW, and debris contaminated with VOCs, and organics including PNAs	102,000 yd^3 (soil and sediments)	Excavation/dredging of soils, sediments, cement, and tank liquids and treatment using onsite incineration with onsite disposal of residual ash, backfilling, regrading, and revegetating, where necessary; installation of a slurry wall; GW and SW pump and treatment using activated carbon adsorption of hydrogen peroxide and UV irradiation with discharge to the onsite pond; installation of a geotextile silt fence, sedimentation basins, and/or diversion/surface management; and GW, SW, environmental, organic vapor, and dust monitoring	All media will attain the cleanup goal for carcinogenic PNAs (CPNAs) of 2.2 ppm based on the maximum lifetime cancer risk. These goals were established for onsite future residents. The ash residue is expected to meet Best Demonstrated Available Technology	$38,163,000 (present worth) $44,000 (O&M present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Tyson's Dump, PA Waste Disposal Facility	09/30/88	2nd-Final	GW contaminated with VOCs including toluene 1,2,3-trichloropropane, and xylenes	Not Provided	GW pumping and treatment using air stripping and vapor-phase carbon, and if necessary, GAC polishing of air-stripped water with offsite discharge of treated water; and GW monitoring	GW cleanup levels include toluene 2.0 mg/l, 1,2,3-trichloropropane 0.00035 mg/l, and xylenes 0.12 mg/l based on 10^{-6} risk level, MCLs, and WQC	$6,170,000 - $6,910,000 (present worth) $424,300 - $509,900 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Tyson's Dump, PA Waste Disposal Facility	03/31/88	Addendum	Soil and bedrock contaminated with VOCs	Not specified	In situ treatment of soil and bedrock using vacuum extraction; treatment of vacuum-extracted water using the onsite leachate water treatment system; and installation of a soil cover following treatment	Cleanup levels were developed using health-based acceptable intake levels and hypothetical exposure scenarios. The scenario producing the most stringent cleanup requirement was selected as the cleanup goal. Individual cleanup goals were listed for 45 contaminants. Cleanup levels for indicator compounds include benzene 50 ug/kg, trichloroethane 50 ug/kg, PCE 50 ug/kg, and 1,2,3-trichloropropane 50 ug/kg	$10,200,000 (present worth)
III	Voortman Farm, PA Waste Disposal Facility	06/30/88	1st-Final	GW monitored for contamination from metals including lead and cadmium	Not specified	No action alternative with continued GW monitoring	Currently, the GW does not violate drinking water standards	$26,010 (present worth) $6,860 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Tyson's Dump, PA Waste Disposal Facility	09/30/88	2nd-Final	GW contaminated with VOCs including toluene 1,2,3-trichloropropane, and xylenes	Not Provided	GW pumping and treatment using air stripping and vapor-phase carbon, and if necessary, GAC polishing of air-stripped water with offsite discharge of treated water; and GW monitoring	GW cleanup levels include toluene 2.0 mg/l, 1,2,3-trichloropropane 0.00035 mg/l, and xylenes 0.12 mg/l based on 10^{-6} risk level, MCLs, and WQC	$6,170,000 - $6,910,000 (present worth) $424,300 - $509,900 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	West Virginia Ordnance Works, WV Industrial Facility	09/30/88	2nd-Final	Soil, sediments, and GW contaminated with nitroaromatics and lead	Not specified	Remedy addresses three distinct areas of contamination. Area 1 - GW pump and treatment with discharge to SW; purchase land, construct a soil cover over the contaminated area, and incorporate land into existing wildlife preserve Area 2 - Relocation of ponds 1 and 2, followed by backfilling with clean fill; and GW pump and treatment with discharge to SW Area 3 - Installation of a soil cover; and GW pump and treatment with discharge to SW	GW goals are based on available standards or a 10^{-6} cancer risk. GW cleanup goals were provided for six contaminants including TNT 50 ug/l	$3,365,000 (present worth) $216,500 (O&M)
III	Westline, PA Wood Processing Facility	06/29/88	2nd-Final	GW contaminated with VOCs including benzene, and organics	Not specified	No action with continued GW monitoring; and implementation of institutional controls to prevent the addition of new drinking water wells	The remedy meets the 8.93×10^{-5} increased cancer risk level. Natural attenuation can meet the MCL for benzene 5.0 ug/l within a 5 to 10-year period. Additionally, WQC and standards have not been exceeded	$0 (capital)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
III	Wildcat Landfill, DE 44-Acre Industrial/ Municipal Landfill	06/29/88	1st	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes, organics including PCBs and metals including arsenic	160 drums (waste material)	Removal and offsite disposal of drums and drum contents with offsite disposal by landfilling, if not hazardous, or incineration, if hazardous; grading, soil cover, and revegetation of direct contact risk areas; replacement of two domestic wells adjacent to the site; GW monitoring; and institutional controls including well and land use restrictions	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$5,400,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IV	Brown Wood Preserving, FL Wood Preserving Facility	04/08/88	1st-Final	Soil, sediments, sludge, and wastewater contaminated with creosote constituents including PAHs	3,000 yd^3 (creosote sediments/sludge)	Removal, treatment (if necessary), and discharge of lagoon water to a POTW; excavation, treatment, and offsite disposal of 1,500 tons of the most severely contaminated soil/sludge; onsite biodegradation of approximately 10,000 tons of the remaining soils in a 14-acre treatment area constructed with a liner and an internal drainage and spray irrigation system; covering of treatment area with clean fill after bioremediation; and GW monitoring	Cleanup levels will meet a 10^{-6} health-based risk level accomplished by reducing the concentration of total carcinogenic indicator PAH compounds to 100 mg/kg throughout the volume of the material treated	$2,740,000 (present worth)
IV	Celanese Fibers Operations, NC Industrial Facility	03/23/88	1st	GW contaminated with VOCs including benzene and PCE, organics including phenols, and metals including chromium	Not specified	GW pump and treatment onsite using air stripping, biological treatment, and carbon adsorption (if necessary), followed by discharge to the onsite wastewater treatment plant	GW cleanup will attain Federal or State MCLs, whichever is more stringent. Individual cleanup goals were not specified	$2,032,000 (present worth) $1,069,230 (present worth O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IV	Chemtronics, NC Waste Disposal Facility	04/05/88	1st-Final	Soil and GW contaminated with VOCs, organics, metals, pesticides, and explosives	Not specified	Multi-layer capping of 5 disposal areas with fencing, placement of a vegetative cover over the cap, and installation of a gas collection/ ventilation system, if necessary; treatability studies for soils associated with Disposal Area 23 to determine the most appropriate soil fixation/ stabilization/ solidification process and mixing ratios followed by onsite capping; GW pump and treatment which may include air stripping, carbon adsorption, or metal removal with discharge and treatment to be determined during design; and sediment, GW, and SW monitoring	GW cleanup levels were based on MCLs and several TBCs. Some individual goals include: TCE 0.005 mg/l, benzene 0.005 mg/l, PCE 0.007 mg/l, toluene 2.0 mg/l, RDX 0.035 mg/l, TNT 0.044 mg/l, lead 0.05 mg/l, and chromium 0.05 mg/l. Some individual soil cleanup goals include: PCBs 10 mg/kg, RDX 95 mg/kg, TNT 305 mg/kg, and CS 43.3 mg/kg	$6,247,300 - $8,242,900 (present worth)
IV	Flowood, MS Industrial Area	09/30/88	1st-Final	Soil and sediments contaminated with lead	6,000 yd^3	Excavation and stabilization/ solidification of contaminated soil and sediments, followed by backfilling and capping with clean fill, as necessary; and GW monitoring	Soil and sediments cleanup levels will attain lead 500 mg/kg, a risk-based level	$2,000,000 (present worth) $25,000 (O&M, year 1)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IV	Goodrich, B.F., KY (RI/FS prepared as B.F. Goodrich/ Airco site) 1-Acre Industrial Landfill	06/24/88	1st-Final	Soil, sediments, and GW contaminated with VOCs including benzene, toluene, EDC, PCE and TCE, organics including PAHs, and PCBs and inorganics	5,000 yd^3 (soil) 6,075,000 ft^3 (GW) (includes volume from Airco, KY site)	Excavation of contaminated soil with placement in pit area, cover with a RCRA cap and construct an organic vapor recovery system to separate VOCs from soil; construction of a flood protection dike; installation of a leachate extraction system around landfill and upgrading of the existing landfill clay cap; GW pump and treatment using air stripping with discharge to the river; and implementation of institutional controls including deed restrictions	GW will be treated to meet ACLs. Individual ACL goals were calculated using a multiplier and MCLs or AWQCs. Individual goals include EDC 8.5 mg/l, TCE 8.5 mg/l, PCE 1.5 mg/l, and benzene 8.5 mg/l. Soil cleanup level will attain an EDC level of 139 mg/kg based on the allowable EDC GW concentration	$2,960,000 (capital) $3,130,000 (present worth O&M) (combined with costs from Airco, KY site)
IV	Independent Nail, SC Industrial Facility	08/30/88	2nd-Final	GW contaminated with metals including chromium	Not applicable	No action remedy	GW poses no threat, thus individual cleanup goals are not applicable	$0

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IV	National Starch and Chemical Corporation, NC Industrial Plant	09/30/88	1st	GW, SW, and sediments contaminated with VOCs including benzene, TCE, toluene and xylenes, and metals including chromium	Not specified	Installation of a GW interception and extraction system downgradient of the source areas with pretreatment including air stripping, filtration through an activated carbon filter, metal removal, or treatment through existing lagoon system which includes presettling and surface aeration; and SW and sediment monitoring. If the POTW declines to accept the treated GW, it will be discharged to a local stream under a NPDES permit	GW cleanup goals were provided for the 25 chemicals of concern and will meet MCLs, if available. If an MCL is not available, the cleanup goal for a carcinogen is set at the limit of detection; and for a noncarcinogen, at the RfD or ACI equivalent level. However, ethyl benzene will meet the proposed MCLG. Individual cleanup goals include: arsenic 10 ug/l (MCL), benzene 5 ug/l (MCL), TCE 5 ug/l (MCL), chromium 2,000 ug/l (MCL), and xylenes 340 ug/l (MCL)	$3,036,000 (present worth) $55,000 (annual O&M)
IV	Perdido Groundwater, AL Waste Spill Area	09/30/88	1st-Final	GW contaminated with benzene	Not specified	GW pump and onsite treatment using air stripping or carbon adsorption with reinjection into the aquifer; and GW monitoring	GW cleanup level will attain the MCL for benzene 5 ug/l	$169,000 (capital) $103,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IV	Wamchem, SC Industrial Facility	06/30/88	1st	Soil and GW contaminated with VOCs and organics	2,000 yd^3	Excavation and low temperature thermal aeration of contaminated soils followed by onsite disposal; GW pump and treatment using carbon adsorption; and GW monitoring	GW cleanup goals were based on federal AWQC and include: benzene 0.7 mg/l, toluene 5.0 mg/l, xylenes 2.0 mg/l. Soil cleanup goals were based on estimates of contaminants that would not result in future exceedences of AWQL in GW at the source due to soil contaminant leaching. Some individual goals include: benzene 2.43 mg/kg, toluene 34.47 mg/kg, total xylene 67.58 mg/kg, and naphthalene 74.57 mg/kg	$1,310,600 (capital) $155,100 (annual O&M)
IV	Zellwood, FL Waste Disposal Facility	12/17/87	1st-Final	Soil, sediments, sludge, and GW contaminated with organics, metals, inorganics, and pesticides	147,825 tons	Excavation of soils and sediments with onsite thermal destruction; residual testing to determine final ash disposal; GW pump and treatment with flushing of treated GW through the abandoned drum area; and GW monitoring	Not specified	$41,264,000 - $61,908,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Allied/Ironton Coke, OH Industrial Facility	09/29/88	2nd-Final	Soil and GW contaminated with VOCs including benzene, and organics including phenols and PAHs, and metals	456,000 yd^3	Installation of a containment system including a slurry wall surrounding the disposal area and multi-media RCRA cap; GW pump and treatment using activated carbon with residual discharge to the Ohio River; provision of an alternate drinking water source; deed restrictions; preparation of a supplemental RI/FS addressing nonaqueous phase substance contamination with implementation of remedy, if different from present containment; and GW monitoring	GW cleanup levels are based on MCLs, AWQCs and 10^{-6} health-based levels and incude benzene 5 ug/l (MCL), phenols 300-3,500 ug/l, and PAHs 0.005 ug/l	$13,130,000 (present worth) $515,000 (annual O&M)
V	Belvidere Landfill, IL 19.3-Acre Industrial/ Municipal Landfill	06/30/88	1st-Final	GW and soil contaminated with organics including PAHs and PCBs, and metals including lead	790,000 yd^3	RCRA capping over entire landfill; remediation of soil from the drum disposal area following sampling to determine extent of PCB contamination; GW pump and treatment possibly using air stripping with either discharge to the river or city treatment plant; GW, pond, and river fish monitoring; fencing; deed restrictions; and flood control measures	GW will be treated until a 10^{-6} cumulative life-time cancer risk is met at the boundary, which is the point of compliance. PCBs > 50 mg/kg will be disposed of, or incinerated, offsite. PCBs < 50 mg/kg will be consolidated on the landfill. Quantitative goals were not specified for other indicator chemicals	$5,900,000 (capital) $271,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Coshocton Landfill, OH 80-Acre Municipal/ Industrial Landfill	06/17/88	1st-- Final	Sediments, GW, SW, and leachate contaminated with VOCs including TCE and toluene, organics including PAHs and PCP, and metals including copper, nickel, and zinc	Not specified	Implementation of institutional controls including deed and access restrictions; site grading; State solid waste landfill capping followed by a topsoil cover and revegetation; and GW, SW, and landfill gas monitoring. Components to be evaluated during design include landfill gas collection and venting; and leachate and GW collection, onsite storage, and onsite or offsite treatment	Contaminants which have established MCLs were below MCL levels. SW and sediment chronic concentration values for aquatic life were not exceeded. State sanitary landfill closure requirements will be met to manage the principle threat of future releases from the site	$8,010,000 (capital) $96,000 (annual O&M)
V	Eau Claire, WI Municipal Well Field	03/31/88	2nd- Final	GW contaminated with VOCs including PCE and TCE	Not specified	GW pump and treatment using the existing air stripper with discharge to the municipal water system; and provision of municipal water to private well users	GW treatment will attain the additive 10^{-6} health-based risk level at the potential receptor, and meet MCLs for TCE 5 ug/l, DCE 7 ug/l, and chloroform 100 mg/l, and State WQC for PCE 1 ug/l	$1,214,200 (capital) $396,700 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Forest Waste Disposal, MI 11-Acre Industrial/ Municipal Landfill	03/31/88	2nd-Final	Soil and GW contaminated with including PAHs and PBBs, VOCs including TCE and toluene, and metals including arsenic and lead	1,000 yd^3 (soil) 4,000 drums (liquid and solid waste)	Removal and offsite incineration of drums and associated contaminated soil, followed by installation of a containment system around the landfill including a RCRA cap, slurry wall, and a dewatering system with a leachate collection, treatment and disposal system; access and deed restrictions; and GW monitoring	Remedy addresses control of contamination, which will ensure GW lifetime cancer risk range of 10^{-4} to 10^{-7}. Cleanup goals for individual chemicals were not specified	$23,820,000 (present worth) $440,500 (annual O&M)
V	Fort Wayne Reduction, IN 15-Acre Municipal Landfill/Waste Disposal Facility	08/26/88	1st-Final	Soil and GW contaminated with 43 indicator chemicals including VOCs, organics, and metals	4,600 drums (liquid wastes)	Municipal landfill: solid waste closure capping; GW monitoring; and deed and access restrictions. Waste disposal facility: excavation, reconsolidation, and on- or offsite incineration from Area C followed by soil capping; GW collection and treatment, if necessary; flood control measures; and compensation for 0.3 acres of wetlands through enhancement of remaining wetlands	Contaminant levels in the area of the municipal landfill do not pose a threat to human health or the environment. GW monitoring will ensure protection of the river through the use of ACLs as a performance standard. Specific goals will be determined during design. MCLs are not ARAR since GW is not used as a drinking water source. The fate of GW in the waste disposal facility area will be determined during design	$10,020,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	IMC/Terre Haute, IN Industrial Facility	06/22/88	1st-Final	Soil contaminated with BHC-tech and the pesticide lindane	28,500 yd^3	No further action (because previous soil cleanup has proven effective in containing the source of contamination) with implementation of a maintenance program; GW monitoring; access restrictions; and establishment of a contingency plan	Remedy addresses control of contaminant migration, thus individual goals are not applicable	$159,000 (present worth O&M)
V	Kummer Sanitary Landfill, MN 35-Acre Landfill	09/30/88	2nd	Soil and GW contaminated with VOCs including TCE, PCE, and benzene	1,300,000 yd^3 (soil and waste material)	Consolidation of soil and other waste material with site grading and construction of a cap consisting of a gas control layer, a low permeability layer (clay or synthetic membrane), and a drainage layer, with soil cover and vegetation; access and deed restrictions; and GW and landfill gas monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	Clay cap $7,400,000 - $12,500,000 (capital) $35,000 (annual O&M) or synthetic membrane $6,900,000 - $11,200,000 (capital) $33,000 (annual O&M)
V	LaSalle Electrical Utilities, IL Industrial Facility	03/30/88	2nd-Final	Soil, sediments, and GW contaminated with VOCs, and organics including PCBs	25,500 yd^3	Excavation and onsite incineration of contaminated soil and sediments; flushing and mechanical cleaning of sewer lines; demolition and disposal of buildings; and GW collection and treatment	GW will be treated to achieve MCLs for VOCs. PCBs >1 mg/l will be treated. Soil will be excavated to 5 mg/kg in surface soils and 10 mg/kg at depths > one foot	$34,495,180 (present worth) $64,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Long Prairie, MN Municipal Well Field	06/27/88	1st-Final	Soil and GW contaminated with VOCs including PCE and TCE	7,000,000 gals	GW pump and treatment using air stripping with discharge to the river; and onsite soil treatment using active venting	Protection will be provided corresponding to the 10^{-5} carcinogenic risk level. Individual goals include TCE 5 ug/l (MCL), vinyl chloride 0.15 ug/l (State), and DCE 70 ug/l (State). Currently, there are no MCLs for PCE or DCE. AWQC will be met by the discharge limit for PCE 5 ug/l. Following treatment, PCE in soil will correspond to the 10^{-6} carcinogenic risk level of 1,400 ug/kg	$890,000 (capital) $390,000 (annual O&M year 1) $250,000 (annual O&M years 2-5)
V	Mason County Landfill, MI 10-Acre Landfill	09/28/88	1st	GW contaminated with VOCs including benzene, PCE, TCE, and xylenes	Not specified	Construction of a RCRA cap over the landfill; deed and access restrictions; and GW monitoring	Remedy addresses control of contaminant migration; establishment of cleanup goals for GW contamination is deferred until a remedy is selected for the GW operable unit	$2,800,000 (present worth) $1,000,000 (present worth O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Mid-State Disposal Landfill, WI 33-Acre Industrial/Municipal Landfill	09/30/88	1st-Final	Soil, GW, and SW contaminated with VOCs including benzene, PCE and TCE, and metals	Not specified	Installation of new soil/clay caps for lagoon and landfill and in situ solidification/stabilization of sludge and landfill gas flaring, if necessary; site monitoring that includes GW, SW, and landfill gas monitoring; offsite GW monitoring; provision of an alternate water supply for nearby residences; improvement of SW drainage; leachate and ponded water collection and offsite treatment; access restrictions; institutional controls;	GW will gradually meet state standards and 10^{-6} cancer risk levels for ingestion as a result of natural attenuation and a decrease in leachate contamination. Individual contaminant goals were not specified	$16,000,000 (present worth) $220,000 (O&M) (year 1) $100,000 (O&M) (years 2-30)
V	Ninth Avenue Dump, IN Waste Disposal Area	09/30/88	1st	GW contaminated with VOCs including benzene, toluene, xylenes, organics including PCBs, metals, and cyanides	250,000 - 700,000 gal (oil)	Extraction of oil and GW with diversion of GW to a recharge system and oil to an onsite storage tank; construction of a soil-bentonite slurry wall which will require filling 0.5-1.0 acre of wetlands; and GW monitoring	Remediation invokes the interim remedy waiver for contaminant-specific ARARs; however, GW treatment and discharge will meet MCLs. Individual MCL goals were not provided	$1,960,000 (capital) $190,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	NL/Taracorp/ Golden Auto Parts, MN Industrial Facility/Lead Smelter	09/29/88	2nd-Final	None	None	No action remedy	No action attains the State ARAR of 1,000 mg/kg for soil lead, as well as the ATSDR guidance level of 500 - 1,000 mg/kg	$0
V	Oak Grove Landfill, MN 45 to 50-Acre Municipal Landfill	09/30/88	1st	Soil, GW and SW contaminated with VOCs including toluene and xylenes	Not specified	Deed and access restrictions; capping with low permeability layer, and top soil cover and vegetation; and air and GW monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$6,400,000 to 11,100,000 (clay cap) (present worth) or $5,500,000 to $9,300,000 (synthetic membrane) (present worth) $42,000 (clay cap) (annual O&M) or $40,000 (synthetic membrane) (annual O&M)
V	Petersen Sand & Gravel, IL Mining and Waste Disposal Area	09/14/88	1st-Final	None	Not applicable	No further action with SW and sediment monitoring	Not applicable	$0
V	Poer Farm, IN Industrial Facility	09/29/88	1st-Final	None	Not applicable	No further action after abandoning GW monitoring wells	Not applicable	$0

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Pristine, OH Waste Disposal Facility	12/31/87	1st-Final	Soil, sediments, GW, SW, and buildings contaminated with VOCs including PCE and TCE, metals, and pesticides (dioxin in soils and sediments only)	37,700 yd^3	Excavation, onsite consolidation; of 1,725 yd^3 of sediments and soil; and in situ vitrification of soil; installation of a french drain; GW pump and treatment using air stripping with offsite discharge to Mill Creek; decontamination of structures followed by removal and disposal at a solid waste landfill; implementation of institutional controls including deed and access restrictions; and GW monitoring	The overall health-based cleanup standard of 10^{-6} cumulative excess cancer risk at the plume boundary will be met for all media. Additionally, this remedy will meet the MCL for lead 50 ug/l	$20,837,000 (capital) $94,800 (annual O&M)
V	Republic Steel Quarry, OH Industrial Facility	09/30/88	1st-Final	Soil contaminated with VOCs and metals	100 yd^3 (soil)	Excavation and offsite disposal of contaminated soil; and GW monitoring	Soil treatment before offsite disposal to meet LDR requirements is not expected to be necessary. Individual removal goals were not specified	$63,200 (present worth)
V	South Andover, MN Waste Disposal Facility	03/30/88	1st	GW contaminated with VOCs including PCE, TCE, and toluene, and metals including arsenic, cadmium, and chromium	Not specified	GW extraction; provision of an alternate water supply to private well users; GW monitoring; and implementation of well use restrictions	Remediation is aimed at controlling migration, not restoring the aquifer to drinking water standards, thus no cleanup levels were established	$760,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Summit National, OH Waste Disposal Facility	06/30/88	1st-Final	Soils, sediments, GW and SW contaminated with VOCs including benzene, toluene, xylenes and TCE, organics including phenols, PAHs and PCBs, and metals including arsenic and chromium	30,500 yd^3 (soil) 1500 yd^3 (sediment) 80,000 gals (drum contents) 1,000-7,500 gals (tank contents)	Excavation and onsite incineration of soil, sediments, and contents of buried drums and tanks, with disposal of incinerator residues in an onsite RCRA landfill; GW pump and treatment and onsite SW treatment using precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon adsorption with discharge of treated water to downgradient SW; installation of multilayered cap with grading and revegetation, and construction of a slurry wall around site perimeter; dismantling and onsite disposal of onsite structures; access and deed restrictions; GW and SW monitoring; and residence relocation	Soil cleanup goals will attain a $2x10^{-5}$ cancer risk level. Discharge levels for treated GW and SW will meet Federal and/or State water quality standards. Individual goals for soil and GW contaminants were not specified	$25,000,000 (present worth) $1,132,250 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	United Scrap Lead, OH Industrial Facility	09/30/88	1st-Final	Soil and sediments contaminated with arsenic and lead	46,600 yd^3 (soil) 400 yd^3 (sediment) 55,000 yd^3 (battery casings)	Excavation and treatment of battery casings and contaminated soil by washing, with lead recovery and offsite disposal or recycling of casings, and replacement of residual soils onsite; excavation and dewatering of sediments onsite and disposal with soil; construction of a soil cover, and revegetation; decontamination of contaminated buildings and debris with offsite disposal; installation of a new residential well; deed restrictions; drainage control; and GW and SW monitoring	The target level for cleanup of battery casings and surficial soil is lead 500 mg/kg based on guidelines from the Center for Disease Control. Soils deeper than one foot will be cleaned to the EP toxicity value for lead, 5 mg/l. Sediments will be cleaned to background lead levels (68 mg/kg)	$26,924,000 (present worth) $55,375 (annual O&M)
V	U.S. Aviex, MI Industrial Facility	09/07/88	1st-Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene and xylenes	11,500 yd^3 (soil)	Onsite soil will be treated using soil flushing; GW pump and treatment (including on- and offsite GW and fluids from the soil flushing) using air stripping with discharge to SW	GW cleanup goals will meet MCLs, proposed MCLGs, or Federal or State water quality criteria. Individual goals include benzene 5 ug/l (MCL), toluene 2,000 mg/l (PMCLG), xylene 440 ug/l (PMCLG), PCE 0.88 ug/l (WQC), and TCE 5 ug/l (MCL)	$3,024,100 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
V	Velsicol Chemical Corporation, IL Waste Disposal Facility	09/30/88	1st-Final	Soil, sediments, GW, and SW contaminated witn VOCs including benzene, organics including PAHs, and pesticides	87,900 yd^3 (soil) 10,200 yd^3 (sediments)	Excavation of soil and sediments, backfilling with clay, and revegetation; construction of a diversion channel; consolidation of all wastes onsite with clean backfill of excavated areas and in situ stabilization, followed by construction of a RCRA cap; construction of a GW collection drain with disposal via deep well injection or treatment using granular activated carbon before offsite discharge; GW and surface monitoring; and deed restrictions	GW cleanup will attain ACLs including benzene 2,000 ug/l; CPAHs 0.031 ug/l; noncarcinogenic PAHs 5.4 ug/l; and phenols 100 ug/l. Soil and sediments will achieve ACLs including benzene 2 mg/kg; CPAHs 0.010 mg/kg; noncarcinogenic PAHs 0.046 mg/kg and phenols 100 mg/kg	$9,081,000 (present worth)
V	Waste Disposal Engineering, MN Waste Disposal Area	12/31/87	1st-Final	GW contaminated with VOCs and organics; landfill covered with lime-sludge cap	Equivalent of 60,000 - 100,000 barrels of hazardous waste within 2,500,000 yd^3 of solid waste	Installation of a RCRA cap; GW pump and treatment using carbon adsorption with offsite discharge to Coon Creek; installation of a clay slurry wall; implementation of institutional controls including well use restrictions; and site monitoring	The existing concentrations of contaminants in Coon Creek will be brought to below the 10^{-6} health-based risk level and other fresh water criteria established under CWA. The point of compliance will be set at the landfill boundary. SWDA standards are not ARAR since institutional controls will prevent any potential use of the contaminated GW. Also, MCLs have not been established for site contaminants	$9,504,796 (capital) $1,862,915 (present worth O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	AT&SF (Clovis), NM Waste Disposal Area	09/23/88	1st-Final	Soil, sediments, GW, and SW contaminated with organics including phenols, inorganics, and metals including arsenic, chromium, and lead	Not specified	Installation of SW run-on controls; evaporation of lake water using a pump and spray sprinkler system; excavation and onsite biodegradation of evaporate and lake sediments in an onsite treatment area; in situ biodegradation of contaminated soil underneath the lake sediments, followed by excavation and placement of the treated soil into the sediment treatment area; capping the treatment area with PVC liner and vegetated soil layer; grading and revegetating the disturbed area; access restrictions; and GW and treatment area monitoring	Remedy is aimed at preventing contamination of the aquifer and will meet all primary State and Federal standards for drinking water. Individual cleanup levels were not specified	$2,840,000 (present worth)
VI	Bailey Waste Disposal, TX Waste Disposal Facility	06/28/88	1st-Final	Soil and sediments contaminated with VOCs including benzene, organics including PAHs, and metals	66,980 yd^3	Relocation, consolidation, and treatment of contaminated sediments and wastes using a solidification technique developed during design followed by onsite disposal and capping of the residual matrix	Remediation will attain the excess cancer risk level of 9x10^{-6} for adults and 1.2x10^{-5} for children. No ARARs exist at this site for contaminated soils and sediments, so no chemical-specific ARARs are available	$13,700,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	Brio Refining, TX Industrial Facility	03/31/88	1st-Final	Soil, sludge, GW, and debris contaminated with VOCs and organics	500,000 - 700,000 yd^3 (soil) 170,225 gals (tank liquids, and NAPLs) 1,757 drums (liquid and solid wastes)	Excavation of soil, pit contents, and surface seeps followed by either incineration (EPA preferred alternative) or aqueous phase biological treatment (PRP preferred alternative) with backfilling of treatment residuals; removal of offsite soil contamination found during RI or RA; consolidation of onsite inert debris and rubble with disposal to be determined during design; removal, decontamination, and dismantling of tanks for future sale or offsite disposal; regrading, placement of topsoil, and revegetation; GW treatment of channel and natural attenuation of aquifer; implementation of institutional controls including deed and access restrictions; and GW, SW, and air monitoring	Media above Endangerment Assessment action levels will be treated to target levels based on a 10^{-6} incremental cancer risk for carcinogens and on an acceptable chronic daily intake for non-carcinogens. Individual action and target levels were not specified. Offsite soil contamination above unspecified background levels will be removed. GW in the channel will be treated to a level determined during design. Since the GW may never be used as a GW source, immediate application of MCLs is not appropriate	$23,308,000 - $23,333,000 (biological treatment) (present worth) $22,458,000 - $26,598,000 (incineration) (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	Dixie Oil, TX Industrial Facility	03/31/88	1st-Final	Soil, GW, and debris contaminated with VOCs, organics, and metals including copper	107,351 yd^3	Site controls including access and deed restrictions; excavation and removal of contaminated offsite soil; consolidation and disposal of onsite debris and rubble; remediation of Mud Gully; operation of the wastewater treatment system followed by dismantling and removal; dismantling, removal, and disposal of tank contents and drums and either selling or offsite disposal of tanks; dismantling and disposal of all process equipment; ambient air sampling and air emissions controls; sampling and monitoring of Mud Gully sediments and GW; and site regrading and revegetation	Endangerment Assessment (EA) did not identify contaminated soil above unspecified EA action levels; therefore, soil treatment is not necessary as long as site controls are enforced. Offsite soil contamination above unspecified background levels will be removed. Mud Gully flood control ditch and the bottleneck will be remediated based on a performance standard to be set during design in cooperation with the Harris County Flood Control District	$241,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	French Limited, TX Industrial Facility	03/24/88	1st-Final	Soil, sludge, and GW contaminated with organics including PCBs and PCP, VOCs, and inorganics including arsenic and metals	70,100 yd^3 (sludge/ sediments) 79,500 yd^3 (soil)	In situ biological treatment; GW pump and treatment; SW treatment; stabilization to prevent leachate generation; backfilling of lagoons with clean soil; and site monitoring	GW will be treated until the point where the 10^{-6} human health criteria can be achieved through natural attenuation in 10 years or less. Additionally, remediation will be consistent with WQC for GW and SW, and TSCA regulations and policy for cleanup of PCBs and PCB-contaminated material. Individual cleanup goals were not specified	$47,000,000 (present worth)
VI	Gurley Pit, AR Waste Disposal Facility	09/26/88	2nd-Final	GW contaminated with metals	Not applicable	No action remedy (long-term GW monitoring as part of a previous source control design)	Concentrations of metals including arsenic, iron, and manganese that exceeded MCLs were not attributable to site contaminants, thus GW cleanup goals are not applicable for this site	$0

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	Industrial Waste Control, AR Industrial Landfill	06/28/88	1st	Soil, sediments, and GW contaminated with VOCs including toluene, organics, and metals including arsenic, chromium, and lead	Area C: 200 drums (liquid wastes) 16,900 yd^3 (soil) Area D: 3,000 drums (liquid wastes) 2,600 yd^3 (soil)	Installation of a french drain with a synthetic liner; excavation of Area D liquid-filled drums with offsite disposal; excavation and onsite stabilization of Area C and D soils with onsite disposal of residual matrix in Area C; categorization and disposal of solids and liquid wastes resulting from previous investigations; GW pump for offsite treatment, mix with contaminated soil and stabilized onsite, or treatment in an onsite facility with discharge to be determined during design; multilayer RCRA capping of area bound by french drain and northern site border; access and land use restrictions; and GW and site monitoring	MCLs for arsenic, cadmium, chromium, lead, and TCE are relevant and appropriate GW cleanup standards; however, the quantitative MCL goals were not specified. GW discharge and effluent limitations will be established by EPA and ADPCE. The stablized matrix will pass RCRA TCLP and/or other EPA-approved leachate test as well as the ASTM strength test	$11,400,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	Koppers Texarkana, TX Wood Preserving Facility	09/23/88	1st	Soil, sediments, and GW contaminated with VOCs including benzene, toluene, and xylene, metals including arsenic, and organics including PAHs and PCP	3,300 - 19,400 yd^3 (soil) 45,000,000 gals (GW)	Excavation of soil exceeding 100 mg/kg CPAHs with backfilling using clean soil, grading, placement of a sod cover, and washing contaminated soil with disposal in an onsite gravel pit or offsite hazardous waste disposal facility; collection and treatment of NAPLs at an onsite wastewater treatment plant using oil/water separation followed by either an activated carbon or fluidized carbon bed system, and recycling or incineration offsite of NAPLs, with reinjection of treated GW into the aquifer with excess GW discharged to SW or to an offsite treatment plant; excavation and treatment of drainage ditch sediments in the soil washing unit; deed and access restrictions; and GW monitoring	The soil cleanup goal is CPAHs 100 mg/kg, corresponding to a $3x10^{-5}$ risk factor. GW levels of free phase cresote will be remediated to a level of non-detection, and NAPLs will be removed to the maximum extent practicable	$6,400,000 (present worth) $300,000 (annual O&M)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	North Cavalcade Street, TX Wood Preserving Facility	06/28/88	1st-Final	Soil, sediments, and GW contaminated with PAHs, and VOCs including benzene, toluene, and xylenes	22,300 yd^3 (soil) 5,600,000 gals	In situ biological treatment of soil (method will be selected after pilot testing); onsite GW pump and treatment using oil/water separation and carbon adsorption with reinjection and, if necessary, discharge into an onsite drainage ditch; and offsite incineration of all nonaqueous phase liquids (NAPLs) separated from the GW	Soil and GW cleanup levels will attain a cumulative 10^{-5} cancer risk level. Individual soil goals include PAHs 1 mg/kg and benzene 0.04 mg/kg. Individual goals for GW include benzene 5 ug/l (MCL), toluene 2,000 ug/l, and xylene 440 ug/l. Additionally, GW will be treated until all NAPLs are completely removed	$4,210,000 (present worth)
VI	Odessa Chromium I, TX Industrial Area	03/18/88	2nd-Final	GW contaminated with metals including chromium	Not specified	GW pump and treatment using electrochemical methods with reinjection; demolition and disposal of building; and site monitoring	Treatment will eliminate chromium > 0.05 mg/l or the MCL promulgated prior to design	$2,836,000 (present worth)
VI	Odessa Chromium II, TX Industrial Area	03/18/88	2nd-Final	GW contaminated with metals including chromium	Not specified	GW pump and treatment using electrochemical methods with reinjection; and site monitoring	Treatment will eliminate chromium > 0.05 mg/l or the MCL promulgated prior to design	$3,618,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	Old Midland Products, AR Industrial Facility	03/24/88	1st-Final	Soil, sediments, sludge, and GW contaminated with organics including PCP and PNAs	9,000 - 21,000 yd^3 (soil) 850 yd^3 (sediments) 450,000 gals (GW) 620,000 gals (lagoon fluids)	Onsite incineration of contaminated surface soils, lagoon sludges and drainageway sediments with onsite disposal of residual ash; placement of a soil cover over ash and revegetation; and lagoon and GW collection and treatment using carbon adsorption	Soils with >1 mg/kg PCP will be excavated and incinerated in accordance with State standards. Soil will meet the 10^{-6} incremental cancer risk level. Treated GW will attain two cleanup levels: PCP 0.2 mg/l (MCL) and the 10^{-5} increased cancer risk for PNAs 28 ng/l (WQC)	$10,300,000 (present worth)
VI	Sands Springs, OK Industrial Facility	06/28/88	2nd-Final	Soil and GW minimally contaminated with VOCs including benzene and TCE, and metals including arsenic, cadmium, chromium, and lead	Not specified	No action with long-term GW and SW monitoring; and implementation of institutional controls including site access restrictions	Nearby residential wells have not been affected and should not become affected based on the direction of GW flow, which is towards the river. In a worst case scenario, discharge from the site to the river would be 4.6 times less than NPDES regulatory standards	$9,300 (capital) $45,600 (annual O&M)
VI	Sol Lynn, TX Industrial Facility	03/25/88	1st	Soil contaminated with PCBs	2,400 yd^3	Excavation of soil with alkali metal polyethylene glycolate (APEG) treatment and backfilling	The soil will be treated to attain the TSCA level for PCBs 25 mg/kg	$2,200,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	Sol Lynn, TX Industrial Facility	09/23/88	2nd-Final	GW contaminatd with VOCs including TCE	12,000,000 gals (GW)	GW pump and treatment using air stripping, and activated carbon before emission to the air, if necessary, with discharge to a sanitary sewer or reinjected into the aquifer; and GW monitoring	GW cleanup will meet the MCL for TCE of 5 ug/l	$2,200,000 (present worth)
VI	South Cavalcade Street, TX Wood Preserving Facility	09/26/88	1st-Final	Soil, sediments, and GW contaminated with VOCs including benzene, toluene, and xylenes, metals including arsenic, chromium, and lead, and PAHs	30,000 yd^3 (soil) 50,000,000 gals (GW)	Excavation and onsite soil washing of 19,500 yd^3 of soil with replacement into excavated area, capping, and wash water treatment in GW treatment system; in situ soil flushing of 10,500 yd^3 of soil; GW pump and treatment of 50,000,000 gallons using physical/chemical separation, pressure filtration, and carbon adsorption with reinjection into the aquifer or, if necessary, discharge to the onsite drainage ditch which discharges to Hunting Bayou; offsite incineration or recycling of all non-aqueous phase liquids (NAPLs) separated out from the GW; GW monitoring; and deed restrictions	Soil cleanup will attain a cumulative 10^{-5} cancer risk level. Individual soil cleanup goals include CPAHs 700 mg/kg and no leaching potential. GW cleanup will attain a cumulative 10^{-4} cancer risk level for CPAHs. Other GW cleanup levels will attain Federal and State standards or background. Individual goals for GW include CPAHs 1 ng/l (no detection), benzene 5 ug/l (MCL), toluene 28 ug/l, xylene 440 ug/l, and arsenic, chromium and lead 50 ug/l (MCLs)	$13,000,000 (present worth)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	South Valley Edmunds Street Ground Water, NM Industrial Area	06/28/88	2nd	GW contaminated with VOCs including PCE and TCE	Not specified	GW pump and treatment using air stripping (packed column aeration) with reinjection to the aquifer through infiltration galleries; and GW and air monitoring	GW will be treated to meet MCLs and New Mexico Water Quality Control Commission Regulations including PCE 20 ug/l (NMWQCC) and TCE 5 ug/l (MCL)	$874,800 (present worth) $280,200 (present worth O&M)
VI	South Valley/ SJ-6, NM Industrial Area	09/30/88	3rd	Well sediments and GW contaminated with VOCs including PCE and TCE	100 ft (well sediment)	Cleaning (excavation of well sediment) and sealing abandoned wells; GW monitoring; and access restrictions	Remedy addresses prevention of contaminant dispersal, thus individual cleanup goals are not applicable. EPA actions involving source control and contaminant plume remediation on adjacent sites will reduce the low concentrations to below State health criteria within 5 years. Federal health criteria are already being attained	$4,000,000 (present worth) $300,000 (annual O&M)
VI	South Valley/ (PL-83), NM Industrial Area	09/30/88	4th	Soil and GW contaminated with VOCs including PCE, organics and metals	36,000 yd^3 (soil)	Soil vapor extration with carbon adsorption treatment of effluent air; GW pump and treatment using air stripping, carbon adsorption, and chemical/physical treatment (if necessary), with reinjection into the aquifer; further sampling and definition of soil and GW contamination; and GW monitoring	Soil will be treated until the vapor extraction system ceases to extract VOCs; GW cleanup will meet MCLs and State WQC. Individual contaminant goals were not specified.	$1,820,000 (present worth of soil remediation; figures for GW remedial action not provided)

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Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VI	Stewco, TX Industrial Facility	09/16/88	1st-Final	No threat	None	No further action	Not provided	$5,000 (capital - for plugging 16 wells)
VI	United Nuclear Corporation, NM Waste Disposal/Mining Facility	09/30/88	1st	GW contaminated with radiological and nonradiological constituents including arsenic, cadmium, cobalt, nickel, radium - 226/228, selenium, and gross alpha	Not specified	Implementation of a GW monitoring program; GW pump and treatment using existing or new extraction wells to control and remove tailings seepage with discharge to an evaporation disposal system; and implementation of a performance monitoring and evaluation program	GW cleanup levels will attain MCLs or State Water Quality Act standards (or background levels where these are higher). Individual cleanup goals include arsenic 50 ug/l (MCL), cadmium 10 ug/l (MCL), cobalt 50 ug/l (NMWQA), nickel 200 ug/l (NMWQA), radium-226/228, 5 pCi/L (MCL), selenium 10 ug/l (MCL), and gross alpha 15 pCi/L (MCL)	$17,000,000 (present worth) $1,000,000 (annual O&M)
VII	Arkansas City Dump, KS Industrial Facility/ 160-acre Municipal Landfill	09/29/88	1st	Sludge contaminated with organics including PAHs, and sulfuric acid	1,300,000 ft^3 (sludge)	In situ neutralization of the acid sludge waste, followed by construction of a soil cover over the waste area; institutional controls including deed restrictions; GW monitoring; and completion of feasibility study addressing the subsequent sediment and GW operable unit	Neutralization of acid sludge ($pH < 2.0$) will eliminate the potential for sulfur dioxide emissions	$788,000 (capital) $3,000 (annual (O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VII	Big River Sand Company, KS Waste Disposal Area	06/28/88	1st-Final	Metals and VOCs present in soil and GW do not pose a significant health threat	Not specified	No action remedy	Metals in the soil and GW are not outside the range of metals found naturally occurring in soil and GW. Additionally, no MCLs are being exceeded in onsite or offsite drinking water wells	$5,800 (future cost if sampling conducted in 5 years)
VII	Cherokee County/Galena, KS Mining District	12/21/87	1st	GW contaminated with metals	Not specified	Provision of an alternate water supply to residences, businesses, and farms; and chlorination rehabilitation of two wells	The goal of this remedial action is to meet the primary MCLs. The water will need no treatment other than chlorination to achieve these levels	$5,300,000 (present worth) $100,000 (annual O&M)
VII	Deere, John Dubuque Works, IA Industrial Facility	09/29/88	1st-Final	GW contaminated with VOCs including benzene, PCE, toluene, and TCE	Not specified	Extraction and offsite discharge of GW; continue GW extraction and collection of NAPLs from well-3, with offsite disposal of NAPLs; provision of an alternate water supply; deed restrictions; and implementation of a contingency plan to contain migration if plant shuts down	Discharged GW will meet NPDES guidelines. GW treatment will meet MCLs and EPA Health Advisories, and withdraw the maximum amount of NAPLs. Individual cleanup goals were not specified	$5,151,800 (present worth) $276,600 (annual O&M)
VII	Fulbright/Sac River Landfill, MO 98 and 114 -Acre Municipal Landfills	09/30/88	1st-Final	Soil, sediments, GW, and SW contaminated with low levels of unspecified wastes	Not specified	Removal and offsite treatment or disposal of drum and drum remnants east of Fulbright Landfill; GW, SW, and leachate monitoring; and deed restriction	Not specified	$246,600 - $270,400 (present worth)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VII	Hastings Ground Water/ Colorado Avenue, NE Industrial Facility	09/28/88	1st	Soil contaminated with VOCs including TCE and PCE	42,700 yd^3 (soil)	In situ soil vapor extraction with activated carbon treatment of extracted vapor, if necessary; and soil, GW and air monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$3,603,000 (present worth)
VII	Hastings Ground Water/ FAR-MAR-CO, NE Industrial Facility	09/30/88	2nd	Soil contaminated with carbon tetrachloride and ethylene dibromide	33,800 yd^3 (soil)	In situ soil vapor extraction with treatment of extracted vapor using activated carbon, if necessary; access restrictions; and soil, air, and GW monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$2,526,000 (present worth)
VII	Midwest Manufacturing/ North Farm, IA Waste Disposal Facility	09/30/88	1st	Soil contaminated with metals including cadmium and cyanide	200 yd^3 (soil)	Excavation of contaminated soil with either onsite or offsite stabilization, followed by offsite disposal; and backfilling and grading of the excavated area to support a vegetative cover	Soil cleanup will attain the health-based action level for cadmium of 13 mg/kg. Soil will be stabilized to the extent that the leachate contaminant concentration, as measured by the TCLP, meets the Land Disposal Regulations standards for F006 nonwastewaters. These standards are cadmium 0.006 mg/l, total chromium 5.2 mg/l, lead 0.51 mg/l, nickel 0.32 mg/l, silver 0.072 mg/l	$140,000 - $170,000 (present worth)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VII	Minker/Stout/ Romaine Creek, MO Residential Area	09/29/88	2nd	Soil contaminated with dioxin	12,000 yd^3 (soil)	Excavation and offsite thermal treatment at Times Beach facility of soil exceeding 20 ug/kg dioxin including soil in temporary storage, with offsite residual disposal also at Times Beach; and capping of areas contaminated with dioxin not exceeding 20 ug/kg	Soil cleanup levels will attain 1 ug/kg dioxin at the surface and 5-10 ug/kg dioxin at a depth of one foot or greater.	$48,800,000 (capital) (includes costs from Times Beach site)
VII	Shenandoah Stables, MO	09/28/88	1st	Soil and structures contaminated with dioxins	3,300 yd^3 (soil)	Excavation of dioxin-contaminated soil with backfilling of excavated areas, placement of waste material in polypropylene bags, and storage of bags in a RCRA-equivalent onsite structure; and decontamination of onsite structures	Soil cleanup will remove surface soils exceeding a dioxin concentration of 1 ug/kg until a residual concentration of 5 to 10 ug/kg is reached or to a maximum depth of 4 feet based on health-based action levels provided by ATSDR	$3,936,500 (present worth)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VII	Syntex Verona, MO Chemical Facility	05/05/88	1st	Soil contaminated with dioxin	860 yd^3 (soil)	Excavation and offsite thermal treatment of all dioxin-contaminated soil exceeding 20 ug/kg, followed by offsite disposal of residual ash; dismantling and decontamination of contaminated equipment with a series of solvents and aqueous rinses; installation of a clay cap and vegetative cover over the Trench Area; and maintenance of vegetative cover over surface soil containing more than 1 ug/kg dioxin	Soil cleanup will attain the site-specific action level of 20 ug/kg	$5,617,000 (present worth)
VII	Times Beach, MO Residential Area	09/29/88	2nd	Soil contaminated with dioxin	13,600 yd^3 (soil) 105,000 yd^3 (debris)	Demolition and onsite disposal of all structures; excavation and thermal treatment of dioxin-contaminated soil exceeding 20 ug/kg with onsite residual disposal; capping of areas contaminated with dioxin not exceeding 20 ug/kg; and construction of a ring levee for flood protection of temporary thermal treatment unit	Soil cleanup levels will attain 1 ug/kg dioxin at the surface and 5-10 ug/kg dioxin at a depth of one foot or greater.	$48,800,000 (capital) (includes costs from Minker/Strout Romaine Creek site)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VIII	Anaconda Smelter, MT Smelter Facility/ 160-Acre Mill Creek Community	10/02/87	1st	Air contaminated with metals including arsenic, cadmium, and lead	Not specified	Relocation of all remaining residents (8 homes) with temporary erosional stabilization using a vegetative soil cover; demolition, consolidation, and temporary onsite storage of debris; implementation of institutional controls including deed and access restrictions; and site maintenance	Risk-based performance goals for arsenic and cadmium appear technically unattainable and were less than background levels. Consequently, background levels for arsenic 0.01 ug/m^3 and cadmium 0.01 ug/m^3 will be met. The NAAQS for lead 1.5 ug/m^3 also will be met	$300,000 (present worth)
VIII	Broderick Wood Products, CO Wood Preserving Facility	06/30/88	1st	Soil, sludge, oil, and wastewater contaminated with VOCs including benzene, organics including PAHs, PCPs, and dioxins, and metals including arsenic and lead	31,000 yd^3 (soil) 3,000 gals (oil) 3,600 yd^3 (sludge) 560,000 gals (wastewater)	Implementation of site access restrictions; excavation and onsite incineration of sludge and oil with offsite disposal of ash residues; excavation of visibly contaminated soils with either onsite incineration (<2,500 yd^3) or onsite storage (>2,500 yd^3); wastewater filtering and treatment using carbon adsorption with onsite discharge or use in the incineration process; and GW monitoring	Disposal of residue ash will meet BDAT treatment standards which include napthalene 7.98 mg/kg, phenanthrene 7.98 mg/kg, pyrene 7.28 mg/kg, toluene 0.143 mg/kg, and xylenes 0.162 mg/kg. Wastewater contaminants will be treated to nondetectable levels to comply with State standards. If these levels cannot be met, State standards will be waived and contaminants will be treated to MCLs	$2,264,000 - $3,603,200 (present worth)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
VIII	California Gulch, CO Mining District	03/29/88	1st-Final	SW, sediments, and GW contaminated with metals including cadmium, copper, lead, and zinc	210 tons (waste discharged per year)	Construction of surge ponds at Yak Tunnel portal; construction of concrete plugs at three tunnel locations; sealing of shafts and drill holes; diversion of surface water away from tunnel recharge areas and grouting of highly fractured rock; implementation of a monitoring network to detect leakage, seeps, or GW migration; and installation of pump and interim treatment should surface seepage occur	This operable unit invokes an interim remedy waiver	$11,982,770 (capital) $460,307 (annual O&M)
VIII	Central City/ Clear Creek, CO Mining District	03/31/88	2nd	Soil and SW contaminated with metals	Not specified	Slope stabilization at Big Five Tunnel and Gregory Incline; and runon controls at all five tailings and waste rock piles	Final ARAR determinations will be addressed in the final operable unit	$1,049,600 (present worth) $20,992 (annual O&M)
IX	Indian Bend Wash, AZ Industrial/ Residential Area	09/21/88	1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using air stripping (packed column aeration) with air emission controls, followed by distribution of the treated water to the municipal water system	GW cleanup will attain MCLs and State action levels. Individual goals include TCE 5 ug/l (MCL), TCA 200 ug/l (MCL), DCE 7 ug/l (MCL), and PCE 0.67 ug/l	$8,728,000 (present worth) $520,000 (annual O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IX	Lorentz Barrel and Drum, CA Waste Disposal Facility	09/25/88	1st	GW contaminated with VOCs including benzene, PCE, and TCE, and other organics including PCBs and pesticides, and metals including arsenic	Not specified	GW pump and treatment using an ozone/UV treatment system, and on exchange, if necessary, with discharge to a local creek	GW cleanup levels will meet MCLs and NPDES discharge limits. Individual goals include benzene 5 ug/l (MCL), PCE 5 ug/l (NPDES), and arsenic 0.23 ug/l. PCBs and pesticides will be removed to detection limits	$3,238,000 (present worth) $198,000 (annual O&M)
IX	MGM Brakes, CA Industrial Facility	09/29/88	1st-Final	Soil, sediments, GW, SW, air, and debris contaminated with PCBs and VOCs	13,510 yd^3	Dismantling of the process building; crushing and removal of concrete slab, and excavation of soil and sediments contaminated with PCBs at concentrations equal to or greater than 10 mg/kg with offsite disposal, followed by backfilling, regrading and revegatation; GW pump and treatment with discharge to a POTW; offsite GW and soil monitoring to determine extent of VOC contamination; and additional remedial measures for GW, if necessary	Soil cleanup level is 10 mg/kg for PCBs based on EPA's National PCB Spill Cleanup Policy. GW cleanup will ensure a 10^{-6} risk level at the site boundary	$5,369,300 (capital) $0 (O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IX	Motorola 52nd Street, Facility AZ Industrial Facility	09/30/88	1st	Soil and GW contaminated with VOCs including 1,1,1-TCA, and metals	Not specified	Soil-gas extraction and treatment onsite; GW pump and treatment of on- and offsite GW with treatment onsite and treated GW used in site manufacturing processes	GW cleanup will meet relevant State/Federal standards and control contaminant migration. Individual cleanup goals were not provided	$7,600,000 (present worth) $700,000 (annual O&M)
IX	Operating Industries, CA 190-Acre Municipal Landfill	11/16/87	2nd	Leachate contaminated with VOCs and organics	Not specified	Onsite treatment of leachate and other collected hazardous liquids using air stripping and carbon adsorption with discharge to the sewer system; and construction of a treatment facility	Leachate will be treated to achieve the LASCD discharge requirements. Individual effluent discharge limits include vinyl chloride 0.013 mg/l, oil and grease 10 mg/l, and total toxic organics 1.0 mg/l. The site will achieve the 10^{-6} health-based risk level	$1,900,000 (capital) $700,000 (annual O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IX	Operating Industries, CA 190-Acre Municipal Landfill	09/30/88	3rd	Air contaminated with methane and VOCs including benzene, PCE, TCE, and toluene	Not specified	Installation of new and use of existing LFG extraction wells; installation of new integrated perimeter and interior LFG headers; installation of multiple completion monitoring wells at the property boundary; installation of LFG destruction facilities; installation of above grade condensate pumps to collect condensate from gas headers, leachate pumps in gas wells and abovegrade leachate sumps with pretreatment of collected leachate and condensate to POTW requirements	Remedy will attain the State ambient air quality standard for vinyl chloride of 10 ppb for a 24-hour period. Additional goals include carbon monoxide 2,000 ppm, sulfin dioxide 500 ppm, and methane concentrations to less than 5 percent of the landfill boundary	$73,000,000 (present worth) $2,340,000 (annual O&M)
IX	Ordot Landfill, Guam 47-Acre Municipal Landfill	09/28/88	1st-Final	Not applicable	None	No action remedy with continued site monitoring	Not applicable	$0
IX	San Gabriel Valley Areas 1, 2, and 4 Private Utility's Well Field	09/29/88	2nd	GW contaminated with VOCs including PCE and TCE	Not specified	Onsite GW pump and treatment using an air stripping system equipped with air emissions controls, with residual discharge to the utility's water distribution system; floodproofing treatment facility; and GW monitoring	GW treatment will attain a cumulative 10^{-6} cancer risk level and meet MCLs for TCE 5 ug/l and DCE 7 ug/l, and State action levels. This will be attained by remediating PCE to below 1.0 ug/l	$13,052,000 (present worth) $7,623,000 (present worth O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
IX	Selma Pressure Treating Company, CA Industrial Facility	09/24/88	1st-Final	Soil and GW contaminated with organics including dioxin/furan and phenols, and metals including arsenic chromium	16,100 yd^3 2,700,000 gals	GW pump and treatment using precipitation, coagulation, and flocoulation with reinjection to the aquifer or offsite discharge; soil excavation, fixation, and replacement into excavated areas followed by construction of a RCRA cap; GW and soil monitoring; and access and land use restrictions and institutional controls on GW use	Soil cleanup will meet the risk-based levels of dioxin/furan 1.0 ug/kg and arsenic 50 mg/kg. GW cleanup will meet the State MCL for chromium of 50 ug/l	$11,280,00 (present worth) $1,300,000 (annual O&M)
IX	South Bay Asbestos, CA Residential Area Levee	09/29/88	1st-Final	Levee soil contaminated with asbestos	Not specified	Stripping and rough grading of levee followed by soil cover and revegetation; implementation of erosion control measures; and deed restrictions	No specific goals specified	$2,374,700 (present worth) $19,000 (O&M)
IX	Tucson International Airport Area, AZ Industrial Area/Landfill	08/22/88	1st	GW contaminated with VOCs including TCE, benzene, and xylenes	Not specified	GW pump and treatment of areas A and B using air stripping with treatment of emissions by GAC, if necessary, and discharge to the municipal water distribution system	GW cleanup levels will attain an overall excess cancer risk level of 10^{-6} by remediating TCE to 1.5 ug/l, thereby reducing the levels of other contaminants below their respective MCLs, State Action Levels, and 10^{-6} excess cancer risk concentrations	$7,328,000 - $7,820,000 (present worth) $393,000 - $450,900 (annual O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
X	Commencement Bay (Near Shore), WA Industrial Area	12/30/87	1st	Soil and SW contaminated with VOCs including benzene, organics including PAHs and PCBs, and metals including lead	45,000 yd^3	Excavation and stabilization of soils exceeding one percent total PAHs; excavation and stabilization of all surface soils exceeding 10^{-6} lifetime cancer risk; removal and stabilization of ponded water; onsite disposal of treatment residuals; asphalt capping of stabilized matrix; SW diversion; GW monitoring; and implementation of institutional controls including land and water use restrictions	Surface soil and sediments exceeding the 10^{-6} health-based risk level will be treated. Individual goals include PCB 1 mg/kg, PAHs 1 mg/kg, benzene 56 mg/kg, and lead 166 mg/kg (acceptable dose). GW cleanup will attain lead 50 mg/l (MCL), benzene 0.53 mg/l (WQC), PCBs 0.2 mg/l (WQC), and PAHs 5-30 ug/l (WQC)	$3,400,000 (present worth)
X	Commencement Bay/Tacoma, WA 190-Acre Industrial/ Municipal Landfill	03/31/88	1st-Final	Soil and GW contaminated with VOCs including benzene, toluene and xylenes, organics and metals including chromium	Not specified	Installation of landfill cap with gas extraction system; GW pump and treatment with offsite discharge to a creek or the sanitary sewer; installation of alternate water supply if needed; and GW monitoring	GW cleanup levels were provided for 10 contaminants of concern based on MCLs, WQC, pretreatment standards, or risk assessments. Individual goals include benzene 5 ug/l (MCL), toluene 14 ug/l (WQC), and xylenes 10 ug/l (risk assessment)	$21,015,000 - $23,418,000 (present worth)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
X	Frontier Hard Chrome, WA Industrial Facility	12/30/87	1st	Soil and structures contaminated with metals including chromium	7,400 yd^3 (soil)	Excavation of soil and onsite treatment using chemical stabilization with replacement of the treated materials; demolition of site buildings; and placement of a final site cover	Soils with chromium in excess of 550 mg/kg will be treated. There is presently no soil standard for chromium. Testing determined that soils < 500 mg/kg would not release chromium to the GW at levels above the drinking water standard of 0.05 mg/l	$2,000,000 (present worth)
X	Frontier Hard Chrome, WA Industrial Facility	07/05/88	2nd-Final	GW contaminated with VOCs including TCE, and metals including chromium	45,000 ft^2 (plume area)	GW pump and treatment using selective media ion exchange to remove chromium followed by carbon adsorption to remove VOCs with discharge into the river or city sewer system; and implementation of institutional controls to restrict GW usage and to control new well drilling	The remedy prevents public exposure to drinking water which exceeds MCLs for chromium 0.050 mg/l, TCE 0.005 mg/l, and 1,1,1-trichloroethane 0.2 mg/l. Additionally, treated GW will meet NPDES requirements, EPA WQC for protection of freshwater aquatic life, or city pretreatment requirements (depending on remedial action determinations for discharge)	$3,800,000 (present worth)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
X	Gould, OR Smelter Facility	03/31/88	1st	Soil and sediments contaminated with metals including lead	80,800 yd^3 (battery casings) 3,370 yd^3 (surface soil) 13,650 yd^3 (subsurface soil) 5,500 yd^3 (sediments) 6,000 yd^3 (matte)	Excavation and separation of battery casing fragments and matte with recycling of those components that can be recycled, offsite RCRA landfill disposal for nonrecyclable components, and onsite disposal of nonhazardous, nonrecyclable components; excavation, fixation/stabilization and onsite disposal of contaminated soil, sediments, and matte followed by soil capping, revegetation, and site grading; and GW, SW, and air monitoring	EP Toxicity Standards for lead, cadmium, chromium, and zinc (values not specified) will determine disposal of nonrecyclable waste. Additionally, the NAAQs for lead 1.5 ug/m^3 (arithmetic average concentration of all samples collected during any one calendar quarter period) will be met	$3,491,603 (capital) $17,073,581 (present worth O&M)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
X	Martin Marietta, OR Industrial Facility	09/29/88	1st-Final	Soil, GW, and debris contaminated with asbestos, VOCs including TCE, organics including PAHs, and inorganics including arsenic, and cyanide	64,870 yd^3	Consolidation of cathode waste material into existing landfill, followed by capping of the landfill; placement of a soil cover over scrubber/sludge ponds; plugging and abandoning production wells and connecting users to the municipal water supply system; collection and treatment of leachate, perched water, and GW using an onsite aqueous treatment (oxidation and precipitation) with onsite discharge to a recycling pond; GW monitoring; and implementation of institutional controls	Soil cleanup goals include arsenic 65 mg/kg based on carcinogenic risk and PAHs 175 mg/kg based on background. GW cleanup will meet proposed ACLs for fluoride 9.7 mg/l and sulfate 3,020 mg/l	$6,707,400 (present worth) $144,000 (annual O&M years 1-5) $55,600 (annual O&M years 6-30)

FY 1988 Record of Decision Summary Table

Region	Site Name, State/Type	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital O&M Costs
X	Pacific Hide and Fur, ID Industrial Facility	06/28/88	1st-Final	Soil contaminated with PCBs	8,200 yd^3	Excavation of soil followed by screening to separate large contaminated materials and stabilization fixation of a portion of the soil using an immobilization technique; construction of a bottom clay liner, where necessary; and capping of the stabilized material along with any remaining contaminated materials; removal of some GW monitoring wells; GW monitoring; and deed and access restrictions. Onsite consolidation will be implemented if pilot testing finds treatment impracticable	The soil cleanup goal for PCBs 25 mg/kg by weight was established as the EPA cleanup policy for PCB spills and corresponds with a 10^{-4} - 10^{-6} health-based risk level for the entire site (including hot spot areas)	$1,330,000 - $1,890,000 (present worth)

SECTION IV

RECORDS OF DECISION SUMMARY TABLE

FY 1982 - 1987

The Record of Decision Summary Table provides an overview of site problems, selected remedies, cleanup criteria and estimated costs provided in the RODs signed between FY 1982-1987. The table is presented by Region, in alphabetical order according to the site name.

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	Auburn Road, NH	09/17/86	1st	GW contaminated with VOCs including TCE, organics, and inorganics	Not provided	Extension of existing municipal water supply	Not provided	$2,372,000 (present worth) $57,000 (annual O&M)
I	Baird and McGuire, MA	09/30/86	1st	GW, soil, and sediments contaminated with VOCs, organics, pesticides, dioxin, PAHs, and metals	191,000 yd^3	Excavation and onsite thermal destruction of contaminated soils; GW pump and treatment with onsite discharge to the aquifer; restoration of wetlands; and relocation of river	Excavation will remove approximately 95 percent of contamination by mass. Action levels for GW remediation will be developed during design	$44,386,000 (capital) $4,132,000 (present worth O&M)
I	Beacon Heights, CT	09/23/85	1st-Final	GW, SW, and soil contaminated with VOCs and organics	Not provided	Excavation of contaminated soils with onsite consolidation; RCRA capping of consolidated wastes, gas venting and stormwater management; leachate collection with offsite disposal at a licensed waste water treatment facility or onsite treatment with discharge to Hockanum Brook; extension of public water supply to the next municipal supply; fencing; and installation of a more extensive GW monitoring system	Excavation of soil to background levels, which will be developed during design	$17,397,000 (capital) $235,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	Cannon Engineering/ Plymouth, MA	09/30/85	1st	GW, SW, soil, and sediments contaminated with PAHs, pesticides, and metals including lead	Not provided	Removal and offsite disposal of tanks, associated pipework, and foundation to a RCRA approved facility	Not provided	$350,000 or $433,000 (capital) $0 (O&M)
I	Charles George, MA	12/29/83	1st	GW contaminated with VOCs	Not provided	Extension of existing water supply system	Not provided	To be determined
I	Charles George, MA	07/11/85	2nd	Air, GW, SW, and sludge contaminated with VOCs including toluene, organics, and metals	Not provided	Capping; SW diversion and collection system; venting off-gas collection system to the atmosphere; and a full peripheral leachate collection system	Not provided	$13,613,725 (capital) $1,252,901 (annual O&M)
I	Davis Liquid Waste, RI	09/29/87	1st	Soil and GW contaminated with VOCs, inorganics, and organics	25,000 yd^3	Excavation and onsite incineration of raw wastes and contaminated soils with backfilling of treated soils not EP toxic; onsite disposal of EP toxic treated soils in RCRA landfill; GW pump and treatment using air stripping and carbon adsorption with reinjection; and provision of an alternate water supply for nearby residences	Soils will be treated to attain 10^{-5} cancer risk level with concentrations of total VOCs reduced to <2 mg/kg. GW will be treated to attain the 10^{-5} cancer risk level which includes reducing concentrations of benzene and TCE to 5.0 ug/l (MCLs) each	$27,392,000 (present worth)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	Hocomonco Pond, MA	09/30/85	1st-Final	GW, SW, soil, and sediments contaminated with organics, inorganics, and metals	Not provided	Former Lagoon: capping with site grading; and relocation of storm drain pipe Kettle Pond Area: pond dewatering and lowering area ground water levels; soil and waste excavation; dewatering sediments with onsite landfilling; air quality monitoring; if necessary, treatment with discharge of effluent water; construction of onsite landfill; and restoration of wetland areas Hocomonco Pond and Discharge Stream: mechanical dredging and onsite disposal of sediments; and treatment of pond water in system constructed for Kettle Pond area Otis Street: seal storm drain Isolated Areas: removal of contaminated materials and onsite disposal	Not provided	$2,213,000 (capital) $56,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	Industri-plex, MA	09/30/86	1st	GW, soil, sludge, and air contaminated with metals, and VOCs including toluene and benzene	1,000 yd^3	Capping with soil grading; GW pump and treatment using air stripping with discharge to the aquifer; development of a multi-service GW response plan; institutional controls; stabilization of side slopes; and treatment of gaseous emissions	Eliminate direct contact threat of soils with arsenic >300 mg/kg, lead >600 mg/kg and chromium >1000 mg/kg. GW treatment will meet MCLs. Air remedy will achieve NAAQS and unit cancer risks	$12,302,300 or $12,612,000 (depending on air treatment) (present worth) $285,500 or $311,000 (depending on air treatment) (annual O&M)
I	Keefe Environmental, NH	11/15/83	1st	SW and soil contaminated with VOCs including TCE and PCE, organics, and metals	Not provided	Removal and offsite disposal of lagoon contents, liner, and highly contaminated soil	Not provided	$500,000 (capital) $0 (O&M)
I	Kellogg-Deering Well Field, CT	09/25/86	1st	GW contaminated with VOCs including TCE and PCE	Not provided	Initiation of existing air stripping facilities with discharge to existing treatment plant and distribution system	GW treatment will achieve a 99 percent TCE removal efficiency, which corresponds to the 10^{-6} excess cancer risk	$69,751 (capital) $0 (O&M)
I	McKin Site, ME	07/15/83	IRM	GW, SW, soil, and air contaminated with VOCs including TCE and PCE	Not provided	Onsite cleaning and salvage of tanks; and offsite disposal of liquids and sludges	Not provided	$47,000 (capital) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	McKin Site, ME	07/22/85	2nd-Final	GW, SW, and soil contaminated with VOCs including TCE and PCE	Not provided	Onsite soil aeration; offsite disposal of drums; soil testing of petroleum contaminated areas; GW pump and treatment; SW discharge system; reevaluation of GW performance standards; offsite GW and SW monitoring program; and site removal and closure activities	GW treatment will meet 10^{-5} cancer risk level criteria including 1,1,1-TCA 92 ug/l and TCE 28 ug/l. Soil will be treated to TCE 0.1 mg/kg	$3,919,000 (capital) $38,900 (annual O&M)
I	Nyanza Chemical, MA	09/04/85	1st	GW, SW, soil, and sediments contaminated with organics, inorganics, and metals	Not provided	Excavation and consolidation of sludge deposits and sediments with backfilling to original grade and revegetation of wetlands; RCRA capping over entire Hill area; construction of upgradient surface and GW diversion system; and downgradient GW monitoring	All outlying sludge deposits and contaminated soils and sediments associated with these deposits will be excavated to background levels for chromium, lead, and mercury	$5,600,000-$9,800,000 (capital) $92,000 (O&M) (year 1) $70,000 (annual O&M) (years 2-30)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	Ottati & Goss, NH	01/16/87	1st-Final	Soil, sediments, and GW contaminated with VOCs including TCE, organics including PCBs, and inorganics	19,000 yd^3	Onsite incineration of 5,000 yd^3 soil and sediments with > 20 mg/kg PCBs; aeration of 14,000 yd^3 of soils <20 mg/kg PCBs and >1 mg/kg total VOCs; GW pump and treatment using air stripping, biological treatment, and ion-exchange with reinjection; and onsite backfilling of all residuals with grading and covering	Soil, sediments, and GW will attain the health-based cleanup level of 10^{-5}. Specific GW goals include 1,2-DCE 3.8 ug/l, TCE 26.0 ug/l, PCE 6.7 ug/l, and benzene 13.0 ug/l. Specific soil and sediment goals include PCBs 20.0 mg/kg and total VOCs 1.0 mg/kg	$8,592,500 (capital) $1,735,000 (annual O&M)
I	Picillo Farm, RI	09/30/85	1st	GW and soil contaminated with PCBs, and VOCs including TCE	3,500 yd^3	Onsite disposal of primarily PCB and phenol contaminated soils in a RCRA/TSCA landfill; and site closure activities	Not provided	$841,000 (capital) $12,120 (O&M) (year 1) $25,648 (annual O&M) (years 2-4) $19,048 (annual O&M) (years 5-30)
I	Re-Solve, MA	07/01/83	1st	GW, SW, and soil contaminated with PCBs, VOCs, and metals	Not provided	Excavation and offsite disposal of lagoon contents and highly contaminated soil; and clay capping of entire site	Not provided	$3,050,000 (capital) $36,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	Re-Solve, MA	09/24/87	2nd-Final	Soil, sediments, and GW contaminated with VOCs, and organics including PCBs	25,500 yd^3	Excavation with KPEG dechlorination and onsite placement of 22,500 yd^3 of soil and 3000 yd^3 of sediments; GW pump and treatment using air stripping and carbon adsorption with reinjection; and institutional controls restricting GW usage	Soils will be treated to PCBs 25.0 mg/kg based on the 10^{-5} cancer risk level. Sediments will be treated to PCBs 1.0 mg/kg. GW will be treated to the 10^{-5} cancer risk which includes MCL values for TCE, PCE, and methylene chloride of 5.0 ug/l each	$7,332,900 (capital) $1,097,000 (present worth O&M)
I	Sylvester, NH	07/29/82	IRM	GW, SW, and air contaminated with VOCs, inorganics, and heavy metals	Not provided	Capping with installation of a slurry wall	Not provided	$8,822,000 (capital) $750,000 (annual O&M)
I	Sylvester, NH	09/22/83	1st	GW, SW, and air contaminated with VOCs, inorganics, and metals	Not provided	GW pump and treatment system	GW treatment will attain ACLs	$4,696,400 (capital) $1,380,000 (annual O&M)
I	Tinkham Garage, NH	09/30/86	1st-Final	GW, SW, and soil contaminated with VOCs including TCE and PCE, organics, and metals	10,800 yd^3	Excavation and onsite treatment of soils via aeration, soil washing, or composting followed by onsite disposal; GW pump and treatment at POTW; and restoration of wetlands	At a minimum, soil will be treated to TVO 1 mg/kg. GW will be treated to 5 ug/l for PCE and TCE	$2,058,000 (capital) $874,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
I	Western Sand & Gravel, RI	09/28/84	1st	GW contaminated with VOCs including TCE, and organics	Not provided	Installation of carbon canister filters as a temporary measure; and installation of a permanent alternate water supply	Not provided	$1,493,513 (present worth) $156,800 (annual O&M) (year 1) $100,800 (annual O&M) (years 2-30)
I	Winthrop Landfill, ME	11/22/85	1st-Final	GW contaminated with organics	Not provided	RCRA capping; alternate water supply; and institutional controls	ACLs for each GW contaminant will be established based on RCRA criteria. If ACL not established, protection will be to background levels	$6,000,000 (capital) $42,000 (annual O&M if ACL not exceeded) $360,000-$1,480,000 (annual O&M if ACL exceeded)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Bog Creek Farm, NJ	09/30/85	1st	GW, soil, and sediments contaminated with VOCs, organics, and metals	Not provided	Removal of waste water and sediments from pond and bog with regrading and covering of both areas and treatment of waste water with discharge to stream; excavation of VOC contaminated soil with onsite or offsite incineration; evaluation of soil washing, segregation, and other technologies to reduce the volume of soils to be incinerated; compacted soil capping; fencing around site and work areas; and evaluation of monitoring program effectiveness	Excavation of soil with >10,000 mg/kg TVOs	$9,200,000 (capital) $54,400 (annual O&M)
II	Brewster Well Field, NY	09/30/86	1st	GW contaminated with VOCs including TCE and PCE	Not provided	GW pump and treatment using existing air stripping facilities with reinjection to the aquifer	Existing air stripping system exceeds State and Federal ARARs for GW which include TCE 10 ug/l (State) and 5 ug/l (Federal)	$163,912 (capital) $27,468 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Bridgeport, NJ	12/31/84	1st-Final	GW, SW, soil, and sediments contaminated with VOCs and PCBs	Not provided	Disposal of oily waste, sediment, and sludge via onsite incineration; removal and disposal of contaminated water using onsite treatment; drum excavation with offsite removal; maintenance pumping; removal and offsite disposal of tanks and waste; and installation of an alternate water supply pipeline	GW must meet TOC limit of 50 mg/l on a 30 day average	$57,672,000 (capital) $20,000 (annual O&M)
II	Burnt Fly Bog, NJ	11/16/83	1st	GW, SW, and soil contaminated with PCBs, VOCs, and metals	Not provided	Excavation and offsite disposal of liquids, sludges, asphalt piles, drums, and contaminated soil from lagoons and northern wetlands; restoration of original site contours and vegetation; and implementation of a 5-year GW monitoring program	Not provided	$2,200,000 (capital) (Phase I) $5,110,000 (capital) (Phase II) $60,000 (annual O&M)
II	Caldwell Trucking, NJ	09/25/86	1st	GW and soil contaminated with PAHs, PCBs, VOCs including TCE, inorganics, and metals including lead	28,000 yd^3	Excavation and heat addition treatment of soil and waste materials with onsite disposal; GW treatment using air stripping; and provision of an alternate water supply	Not provided	$5,490,000 (capital) $48,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Chemical Control, NJ	09/19/83	1st	GW and soil contaminated with VOCs, organics including PCBs, pesticides, and inorganics	Not provided	Removal of gas cylinders; reconstruction of storm sewer catch basins and grates; cleaning of the storm sewer system with constructon of curbing; and decontamination of box trailer and vacuum truck	Not provided	$732,500 (capital) $0 (O&M)
II	Chemical Control, NJ	09/23/87	2nd	Soil contaminated with VOCs, organics, inorganics, and pesticides	18,000 yd^3	In-situ fixation of 18,000 yd^3 of soil; repairing berm to prevent surface runoff into adjacent river; removal of debris; and sealing of a sanitary sewer	Cleanup goals for contaminants in the soil were not specified	$7,208,000 (capital) $57,400 (annual O&M) (year 1-5) $22,400 (annual O&M) (years 6-30)
II	Combe Fill North, NJ	09/29/86	1st-Final	GW and soil contaminated with organics and low levels of VOCs	Not provided	Capping with grading and compacting of disposal areas; installation of drainage and venting systems; and site fencing	Not provided	$10,500,000 (capital) $168,000 (annual O&M)
II	Combe Fill South, NJ	09/29/86	1st-Final	GW and soil contaminated with VOCs including TCE and PCE	Not provided	RCRA capping; active gas collection and treatment system; GW and leachate pump and treatment with discharge to brook; alternate water supply; SW controls; and fencing	Not provided	$46,060,700 (capital) $673,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Cooper Road, NJ	09/30/87	1st-Final	None	Not applicable	No further action	Not provided	$0
II	Diamond Alkali, NJ	09/30/87	1st	Soil, debris, GW, and air contaminated with pesticides including TCDD and DDT	Not provided	Construction of site slurry wall and flood wall; disassembly and decontamination of structures and materials for offsite reuse, recycling, or disposal; offsite transportation of all drums containing hazardous substances >1 ug/kg TCDD for treatment or disposal; securing of all material with >1 ug/kg TCDD onsite; stabilization of remaining drums with dioxin-contaminated materials; GW pump and treatment; plugging or rerouting underground conduits; and onsite placement and capping of sludge	Cleanup levels will attain 10^{-6} cancer risk level. GW will be treated to include dioxin 1.4×10^{-5} ug/l, DDT 2.4×10^{-2} ug/l, and hexachlorobenzene 7.4×10^{-1} ug/l. Soil and structures will be treated to dioxin 1.0 ug/l	$8,068,000 (capital) $261,000 (annual O&M)
II	D'Imperio Property, NJ	03/27/85	1st-Final	GW and soil contaminated with VOCs	3,900 yd^3	Excavation and offsite disposal of contaminated waste, soil, and surface drums; RCRA capping; and GW pump and treatment	Cleanup will be monitored and assessed in accordance with Drinking Water Standards to determine need for additional remediation	$4,251,551 (capital) $1,169,449 (present worth O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Endicott Village Well Field, NY	09/25/87	1st	GW contaminated with VOCs	3,700 gpm (to be treated)	GW treatment with air stripping and chlorination; and continued operation of an existing purge well to intercept contamination on its way to the supply well	GW treatment will attain MCL values which include vinyl chloride 2 ug/l, 1,2-dichloroethane 5 ug/l, and trichloroethane 5 ug/l. Tetrachloroethene 0.88 ug/l and 1,1,2-trichloroethane 0.6 ug/l will meet levels established by the FWQC, and will meet the 10^{-6} cancer risk level. Vinyl chloride air emission will meet the National Emission Standard for Clean Air of 10 ppm	\$1,200,000 (capital) \$147,000 (annual O&M)
II	Florence Landfill, NJ	06/27/86	1st-Final	GW and soil contaminated with VOCs and metals	Not provided	Capping with slurry wall containment system; removal and onsite disposal of lagoon liquids and surface debris; leachate collection, treatment, and offsite disposal; gas collection and treatment; and partial fencing	Not provided	\$8,021,000 (capital) \$170,000 (annual O&M)
II	Friedman Property, NJ	04/30/85	1st-Final	No threat	None	No action with five-year onsite well monitoring; and deed restrictions	Not provided	\$0 (capital) \$12,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	GE Moreau, NY	07/13/87	1st	Soil, SW, and GW contaminated with VOCs including TCE, and organics including PCBs	8,600 yd^3	Excavation of soil with disposal under cap; slurry wall installation (completed); SW and GW treatment with air stripping; and extension of municipal water supply to affected residents	Soil cleanup goals were not specified. GW and SW treatment will attain the MCL for TCE 5.0 ug/l and the State guidance value for 1,2-DCE 50.0 ug/l	$16,382,000 (capital) $78,000 (annual O&M)
II	GEMS Landfill, NJ	09/27/85	1st-Final	GW, SW, soil, and air contaminated with VOCs, inorganics, and organics	Not provided	Capping with regrading of existing landfill slopes; gas collection and treatment system; GW pump and treatment with discharge to POTW or SW; remediation of Holly Run and Briar Lake; SW controls; fencing; and extension of existing water supply system	Discharge criteria will be established by the State and are dependent on the point of discharge (to be determined)	$27,365,000 (capital) $601,000 (annual O&M)
II	Goose Farm, NJ	09/27/85	1st	GW, SW, and soil contaminated with VOCs including TCE, and organics including PCBs	Not provided	GW and soil flushing with GW treatment and reinjection into soil; and conduction of testing programs to evaluate capping and extent of drum pit PCB contamination	GW treatment system will be designed to meet NPDES permit limits	$3,014,000 (capital) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Haviland Complex, NY	09/30/87	1st-Final	Sediments and GW contaminated with VOCs and metals	Not provided	GW pump and treatment with air stripping; provision of an alternate water supply; and excavation of contaminated sediments from local septic disposal systems	Specific treatment goals will be determined during pilot studies	$1,257,500 (capital) $105,500 (annual O&M)
II	Helen Kramer, NJ	09/27/85	1st-Final	GW and SW contaminated with VOCs including TCE, organics, and inorganics	Not provided	Clay capping with slurry wall containment system; gas collection and treatment system; dewatering, excavation, and filling of leachate ponds and lagoons; fencing of site and work areas; SW controls; and GW and leachate collection and treatment with disposal at POTW or to SW	Not provided	$36,478,000 or $38,089,000 (capital) (pending onsite treatment) $1,047,900 (annual O&M) (year 1 pretreatment) $792,100 (annual O&M) (complete onsite treatment)
II	Hudson River, NY	09/25/84	1st-Final	Soil and river sediments contaminated with PCBs	Not provided	In situ containment of remnant shoreline deposits; and evaluation of Waterford water treatment facility	Not provided	Not provided

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Hyde Park, NY	11/26/85	1st-Final	GW and soil contaminated with VOCs, and organics including PCBs and dioxin	80,000 tons	Extraction and incineration of non-aqueous phase liquids; GW pump and treatment using activated carbon; and construction of plume contaminant systems	The 10^{-6} cancer risk level will be achieved	$17,000 (present worth O&M (not provided)
II	Katonah Municipal Well, NY	09/25/87	1st-Final	GW contaminated with VOCs including PCE	Not provided	Installation of a new GW production well and onsite treatment with air stripping prior to discharge to POTW	The cleanup goal for PCE is less than 1.0 ug/l or nondetectable and is based on 10^{-6} cancer risk level	$1,365,000 (capital) $296,000 (annual O&M)
II	Kentucky Avenue Well Field, NY	09/30/86	1st	GW contaminated with VOCs including TCE	Not provided	Extension of public water supply to private well users; and GW monitoring	Remedy will attain the MCL for TCE 5 ug/l	$303,800 (capital) $19,000 (annual O&M)
II	Krysowaty Farm, NJ	06/20/84	1st-Final	GW and soil contaminated with VOCs, organics, and pesticides	Not provided	Excavation and offsite disposal of contaminated soil and waste; and provision for a permanent alternate water supply	Not provided	$2,164,014 (capital) $145,698 (annual O&M)
II	Lang Property, NJ	09/29/86	1st-Final	GW, SW, soil, and sediments contaminated with VOCs and metals	6,500 yd^3	Excavation and offsite disposal of soils and waste material with filling and grading; GW pump and treatment with reinjection into aquifer; and fencing	GW treatment effluent will attain SDWA criteria	$2,322,000 (capital) $612,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Lipari Landfill, NJ	08/03/82	1st	GW, SW, and soil contaminated with VOCs and organics	Not provided	Capping with slurry wall containment system; and GW collection and onsite treatment at POTW	Not provided	$1,769,150 (capital) $91,250 (annual O&M)
II	Lipari Landfill, NJ	09/30/85	2nd	GW and soil contaminated with VOCs including toluene, organics, and metals	Not provided	GW and leachate extraction with injection wells within containment system for flushing and dewatering with onsite pretreatment and discharge to POTW; and flushing of containment system for cleansing	Marginal successive flushing cycle benefits and effects of leachate release into GW will be evaluated within 5 years	$3,464,000 (capital) $715,000 (annual O&M)
II	Lone Pine Landfill, NJ	09/28/84	1st-Final	GW, SW, and soil contaminated with VOCs, pesticides, and metals	Not provided	Multi-layer surface sealing with slurry wall containment system; and GW collection and treatment at POTW or onsite plant	Not provided	$10,642,050 (capital) $324,734 (annual O&M)
II	Love Canal, NY	05/06/85	1st	SW, sediments, and air contaminated with VOCs, organics, pesticides including dioxin, and metals	Not provided	Removal and dewatering of contaminated creek sediments; inspection of sewer reaches for defects, repairing of damaged flood gate, and hydraulic cleaning of designated sewers; dredging and cleaning of culverts; berm construction; interim onsite storage of sediments; and installation of an administration building	CDC recommends soil treatment to TCDD 1 ug/kg	$8,929,000-$12,000,000 (capital) O&M (not provided)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Marathon Battery, NY	09/30/86	1st	SW, sediments, and biota contaminated with metals including cadmium, nickel, and cobalt	30,083 yd^3	Hydraulic dredging of sediments with chemical fixation and offsite disposal; dredging, water treatment, and disposal; marsh restoration; and site access restrictions	Sediments will be treated to a 100 mg/kg established background concentration. Standards for total cadmium water concentrations include 6.6×10^{-4} mg/l and 2.0×10^{-3} mg/l for water hardness levels of 50 mg/l and 200 mg/l, respectively	$16,640,000 (capital) $3,530,000 (annual O&M) (year 1) $180,000 (annual O&M) (years 2–5) $127,000 (annual O&M) (years 6–30)
II	Metaltec/Aero-Systems, NJ	06/30/86	1st	Soil and GW contaminated VOCs including TCE and PCE, and metals including copper, chromium, and lead	10,000 yd^3	Excavation with heat treatment and offsite disposal of soils; and alternate water supply	MCLs and State guidelines set action levels for GW of TCE 5 ug/l and PCE 5 ug/l. Soil action levels include copper 170 mg/kg, chromium (total) 100 mg/kg, and lead 100 mg/kg	$7,005,000 (sanitary landfill) or $11,735,000 (RCRA landfill) (capital) $179,000 (annual O&M)
II	Montgomery Township, NJ	09/29/87	1st	GW contaminated with VOCs including TCE	Not provided	Extension of Elizabethtown water supply system to affected residences	Water supply will be monitored regularly for compliance with MCLs	$319,000 (capital) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Olean Well Field, NY	09/24/85	1st	GW contaminated with VOCs including TCE	Not provided	Reactivation of municipal wells; construction of two air stripping systems for GW treatment with discharge to public water supply system; extension of existing Olean water lines; inspection of McGraw Edison industrial sewer and analysis of repair and replacement options; and recommendation of institutional controls to restrict GW usage	GW will be treated to TCE 5 mg/kg	$1,996,780 (capital) $799,040 (annual O&M)
II	PAS Oswego, NY	06/06/84	1st-Final	Soil contaminated with organics, VOCs, and metals	Not provided	Limited excavation and offsite removal of contaminated soil, subsurface tanks, and drums; RCRA capping with slurry wall containment system and site grading; and GW and leachate recovery and treatment	Not provided	$1,363,700 (capital) $117,000 (annual O&M)
II	Pijak Farm, NJ	09/30/84	1st-Final	GW and soil contaminated with VOCs, PCBs, organics, pesticides, and metals	Not provided	Removal and offsite disposal of drums and lab packs; and excavation and offsite disposal of visibly contaminated soil with GW pumping and removal	Not provided	$1,962,750 (capital) $53,600 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Price Landfill, NJ	09/20/83	1st	GW and soil contaminated with VOCs and organics	Not provided	Replacement and relocation of the water supply well field and transmission facilities; and analysis of plume management, source control and GW treatment remedies	Not provided	$5,070,000 (capital) O&M (not provided)
II	Price Landfill, NJ	09/29/86	2nd-Final	GW contaminated with VOCs including TCE, organics, and inorganics	Not provided	GW pump and onsite pretreatment with discharge to a POTW; site capping; and fencing	Extraction and treatment will continue until TVO concentration reaches 10 ug/l or less in GW	$9,050,000 (capital) $1,010,000 (annual O&M) (years 1-5) $255,000 (annual O&M) (years 6-25)
II	Renora, Inc., NJ	09/29/87	1st	Soil and GW contaminated with VOCs, organics including PCBs and PAHs, inorganics, and pesticides	5,500 yd^3	Biodegradation of 4,400 yd^3 of PAH contaminated soil; excavation of 1,100 yd^3 of PCB contaminated soil with offsite disposal (landfilling or incineration); and backfilling, grading, and revegetation	Soil will be treated to total VOCs 1.0 mg/kg, total PAHs 10.0 mg/kg, total petroleum hydrocarbons 100.0 mg/kg, cadmium 3.0 mg/kg, zinc 350.0 mg/kg, and PCBs 5.0 mg/kg. GW will be treated to total VOCs 50.0 ug/l, arsenic 50.0 ug/l, cadmium 10.0 ug/l, chromium 50.0 ug/l, and lead 50.0 ug/l	$1,401,000 (landfilling) (present worth) or $6,021,000 (incineration) (present worth)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Rockaway Borough Well Field, NJ	09/29/86	1st	GW contaminated with VOCs including TCE and PCE	Not provided	GW treatment using existing system	Municipal treatment system will be designed in accordance with SDWA standards to remove TCE and PCE to 5 ug/l each	$0 (capital) $74,800 (annual (O&M)
II	Sharkey Landfill, NJ	09/29/86	1st-Final	GW and soils contaminated with VOCs including TCE, inorganics, and metals	Not provided	Capping; and GW pump and treatment	Not provided	$23,173,000 (capital) $330,000 (annual O&M)
II	Sinclair Refinery, NY	09/30/85	1st	Soil contaminated with VOCs and metals	Not provided	Removal and offsite disposal of 300 drums; backfilling with clean fill; onsite consolidation of waste from South Landfill area with RCRA capping; site fencing; and partial river channelization	GW and SW will be treated to total organics 100 ug/l, toluene 10 ug/l, 1,1,1-trichloroethane 50 ug/l, arsenic 5 ug/l, zinc 30 ug/l and PCBs 0.0095 ug/l. Soil will be treated to toluene 72 ug/l, trans-1,2-dichloroethylene 325 ug/kg, arsenic 15,000 ug/kg, zinc 53,000 ug/kg, and PCBs 12.1 ug/kg	$8,759,000 (capital) $30,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	South Brunswick Landfill, NJ	09/30/87	1st-Final	GW and SW contaminated with VOCs and metals	Not provided	Remediation completed in 1985 (capping, slurry wall, and leachate collection system). Post-remediation monitoring will continue for 30 years	Chemical-specific levels will be addressed in he post remedial monitoring program	$0 (no additional funding necessary)
II	Spence Farm, NJ	09/30/84	1st	GW and soil contaminated with organics, metals, and inorganics	Not provided	Excavation and offsite disposal of all drums, lab packs, and visibly contaminated soil; and site grading and surface restoration	Not provided	$845,500 (capital) $95,300 (annual O&M)
II	Suffern Village Well Field, NY	09/25/87	1st-Final	Potential contamination of GW with VOCs	Not applicable	No further action with GW monitoring	GW levels for 1,1,1-TCA comply with the NYSDEC guideline of 50.0 ug/l	$0 (capital) $311,000 (present worth O&M)
II	Swope Oil, NJ	09/27/85	1st	GW and soil contaminated with VOCs, and organics including PCBs	Not provided	Capping; removal of tanks and building debris with offsite incineration; treatment or disposal of tank contents with offsite disposal of tanks and building debris; excavation and offsite disposal of buried sludge waste area; and excavation and offsite disposal of PCB contaminated soil	In accordance with State policy, soils will be excavated up to 1.5 feet, which contain PCBs >5 mg/kg	$5,590,356 (capital) $33,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Syncon Resins, NJ	09/29/86	1st	GW, soil, and sediments contaminated with VOCs, PCBs, organics, pesticides, and metals	700 yd^3	Excavation of lagoon sediments and highly contaminated subsurface soils with offsite disposal	Soil removal to achieve PCBs 5 mg/kg, base-neutrals 100 mg/kg, TVOs 1 mg/kg, and numerous levels for metals. No standards have been set for GW treatment	$5,600,000 (capital) $209,000 (annual O&M)
					2,000 yd^3	Excavation and offsite disposal of surface soils; and GW pump and treatment		
II	Vega Alta, PR	09/29/87	1st	GW contaminated with VOCs including TCE and PCE	3,800,000 gpd (supply)	GW pump and treatment using scaling pretreatment, air stripping, and possibly activated carbon with discharge to creek or public distribution system; and the shutting down of two wells with connection to the public distribution system	GW pump and treatment will attain the 10^{-6} health-based risk level which includes MCL values for PCE 0.7 ug/l, 1,1,1-dichloroethene 0.23 ug/l, benzene 0.7 ug/l, and trichloroethene 2.8 ug/l. The ultimate attainment of MCLs will require identification and control of source(s)	$4,106,000 (capital) $581,000 (annual O&M)
II	Vestal Water Supply Well 1-1, NY	06/27/86	1st	GW contaminated with VOCs including TCE	Not provided	GW pump and treatment using air stripping; alternate water supply; and cessation of untreated discharge to river	Not provided	$389,400 (capital) $119,750 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Volney Landfill, NY	07/31/87	1st	GW contaminated with VOCs and metals	4,000,000 yd^3	Supplemental capping of landfill side slopes covering approximately 35 acres; installation of a leachate collection system to include a slurry wall, collection wells, and force mains; and offsite or onsite treatment of contaminated leachate, which will be determined during design (flow equalization, batch biological treatment, and carbon absorption considered)	Cleanup goals will meet the MCL values for vinyl chloride 1.0 ug/l, benzene 5.0 ug/l, and arsenic 50.0 ug/l. Additionally, chloroform 0.0 ug/l, nickel 15.4 ug/l, and arsenic 0.0 ug/l will meet WQC values. Total phenols 1.0 ug/l will meet the NY State value	\$12,754,000 (offsite treatment) (capital) \$12,876,000 (onsite leachate treatment) (capital) \$882,000 (offsite leachate treatment) (present worth O&M) \$691,000 (onsite leachate treatment) (present worth O&M)
II	Waldick Aerospace, NJ	09/29/87	1st	Soil contaminated with VOCs including TCE, and inorganics	10,500 yd^3	In situ air stripping of 8,000 yd^3 from the saturated zone; excavation and offsite disposal of 2,500 yd^3 residuals with contamination above action levels; institutional controls to include site access and well restrictions; and fencing	Soil will be excavated to New Jersey Department of Environmental Protection levels which include cadmium 3.0 mg/kg, chromium 100.0 mg/kg, zinc 350.0 mg/kg, nickel 100.0 mg/kg, total VOCs 1.0 mg/kg, and total PHCs 100.0 mg/kg	\$2,602,118 (capital) \$55,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
II	Wide Beach, NY	09/30/85	1st-Final	GW and soil contaminated with PCBs	Not provided	Excavation and chemical treatment of PCB contaminated soil with backfilling of treatment residuals; offsite disposal of contaminated asphaltic material, and repavement of roadways and driveways; perched water treatment in sewer trench; construction of hydraulic barrier at end of sewer trench; conduction of treatability study to determine effective PCB and soil treatment; and sewage and sediments sampling	Based on 10^{-6} lifetime cancer risk, media cleanup goals include soil 10 mg/kg, air 1.67 ug/m^3, GW 100 ug/l, and SW 7.9×10^{-5} ug/l	$9,295,000 (capital) $0 (O&M)
II	Williams Property, NJ	09/29/87	1st-Final	Soil and GW contaminated with VOCs including PCE, organics, and metals	700 yd^3	Excavation of soil with removal to an offsite disposal facility for incineration; regrading, revegetation, and site restoration; GW pump and treatment using air stripping and carbon adsorption with reinjection; and provision of an alternate water supply to affected residences	Soil will be excavated to the New Jersey Environmental Cleanup Responsibility Act (ECRA) target level of 1.0 mg/kg total VOCs. GW will be treated to MCLs which include TCE 5.0 ug/l, chloroform 100.0 ug/l, barium 1,000.0 ug/l, arsenic 50.0 ug/l, cadmium 10.0 ug/l, chromium 50.0 ug/l, and lead 50.0 ug/l	$513,750 (capital) $64,600 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Army Creek Landfill, DE	09/30/86	1st	GW, SW, soil, and sediments contaminated with VOCs, inorganics, and metals	1,900,000 yd^3	Capping; downgradient GW pumping with monitoring; and possible upgradient controls	Not provided	$12,030,000 or $12,340,000 (upgradient controls) (capital) $306,000 or $388,000 (upgradient controls) (annual O&M)
III	Blosenski Landfill, PA	09/29/86	1st	GW, SW, and soil contaminated with PCBs, VOCs including benzene and TCE, inorganics, and pesticides	Not provided	Excavation and removal of buried drums and other materials with RCRA offsite disposal; alternate water supply; GW pumping with onsite treatment; capping with SW diversion and gas venting ; and source reduction program	Removal of contaminated media will attain a 10^{-6} excess cancer risk. GW will initially be treated to ACLs, then to levels established by NPDES	$11,000,000-$15,000,000 ($13,000,000 (estimated baseline cost) (capital) $534,300 (annual O&M) (years 1-2)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Bruin Lagoon, PA	06/02/84	1st	GW, SW, and soil contaminated with asphalt sludge, acid liquids, waste oil, resins, fly ash, coal fires, sulphuric and sulfonic acids, and petroleum waste	Not provided	Removal and offsite disposal of liquid lagoon contents with physical stabilization of lagoons, effluent pond cleanup and dike stabilization; capping; and GW diversion	Not provided	$1,456,000 (capital) $60,000 (annual O&M)
III	Bruin Lagoon, PA	09/29/86	2nd-Final	Soils and bedrock contaminated with acidic sludges and metals	17,500 yd^3	Stabilization/ neutralization of sludge and perched liquid zone; in situ bedrock treatment; and capping	Not provided	$2,695,000 (capital) $16,000 (annual O&M)
III	Chisman Creek, VA	09/30/86	1st	GW, soil (disposal pits with fly ash), and SW contaminated with trace metals and inorganics	484,600 yd^3	Capping (2 pits); capping and upgradient GW diversion of one pit; alternate water supply; possible deed restrictions; and GW drainage and onsite treatment	Action for nickel complies with the AWQC for protection of fresh water aquatic life (88 ug/l - 280 ug/l) and salt water aquatic life (17 ug/l)	$14,119,000 (capital) $506,000 (annual O&M) (year 1) $64,000 (annual O&M) (years 2-30)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Delaware City PVC, DE	09/30/86	1st	GW, SW, and soil contaminated with VOCs including TCE	25,000 yd^3	Excavation and removal of contaminated soils and sludges with offsite disposal; capping; GW pumping and treatment; and alternate water supply	Recovery wells will operate until concentrations of VCM, EDC, and TCE reach 1 ug/l, 0.94 ug/l, and 2.7 ug/l, respectively, for two consecutive sample analyses	$1,904,000 (capital) $43,000 (annual O&M)
III	Douglassville, PA	09/27/85	1st	Soil and sediments contaminated with VOCs, pesticides, organics including PAHs and PCBs, and metals	Not provided	Removal and consolidation of contaminated sediments from the drainage ditch, drainage swale, buried lagoon, and drum disposal areas, with onsite disposal under cap; capping former sludge lagoon area and sludge disposal area; installation of levees and dikes to protect from 100-year flooding event; and soil predesign study to determine extent of excavation and capping	Not provided	$5,569,500 (capital) $196,000 (annual O&M)
III	Drake Chemical, PA	09/30/84	1st	GW, SW, soil, and stream sediments contaminated with VOCs, pesticides, and inorganics	Not provided	Capping and grading of leachate stream; partial excavation and temporary onsite storage of contaminated sediments; and construction of conduit and a granular drain	Not provided	$445,311 (capital) $9,427 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Drake Chemical, PA	05/13/86	2nd	GW, soil, sludges, buildings, and debris contaminated with organics and inorganics	3,900 yd^3 192,000 gals	Incineration of onsite chemicals; demolition and offsite removal of buildings, tanks, and debris; waste water pump and treatment of lagoons; metal recycling; and analysis with possible disposal of metal decontamination recycling fluid	Not provided	$3,143,000 (capital) $0 (O&M)
III	Enterprise Avenue, PA	05/10/84	1st-Final	SW and soil contaminated with VOCs, organics, and metals	Not provided	Offsite disposal of soils which fail key indicator parameter testing levels; backfilling of site with soils which passed parameter test; and grading and vegetating as a final cover	Not provided	$4,324,000 (capital) $4,200 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Fischer & Porter, PA	05/04/84	1st-Final	SW contaminated with VOCs including TCE and PCE	Not provided	Improvements in manufacturing facility to prevent release; onsite installation of pumping wells and packed column aeration to reduce contaminant levels in effluents, with discharge to SW; and treatment of contaminated wells	Not provided	Not provided
III	Harvey-Knott, DE	09/30/85	1st-Final	GW, SW, and soil contaminated with VOCs, metals, organics including PCBs, and inorganics	Not provided	SW collection and treatment with offsite disposal; removal and offsite disposal of sediments, sludges, bulk wastes, drums, and debris; GW extraction and treatment with reinjection to soil for flushing; and site grading with 2 foot clean soil cover	Target soil and GW ACLs will be established during design	$3,572,000 (capital) $44,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Heleva Landfill, PA	03/22/85	1st-Final	GW and SW contaminated with VOCs including TCE and PCE	Not provided	RCRA capping; SW diversion and gas venting systems; conduction of a predesign study to fully delineate the source of contamination and determine sink-hole activity; construction of an onsite treatment facility; GW pump and treatment; and extension of municipal water main to affected residents	GW will be treated to PCE 1.0 ug/l, TCE 1.8-5.0 ug/l, vinyl chloride 2.0 ug/l, 1,1,1-trichloroethane 21.7 ug/l, and toulene 15,000 ug/l	$7,791,000 (capital) $62,000 (annual O&M)
III	Industrial Lane, PA	09/29/86	1st	GW contaminated with VOCs	Not provided	Provision of alternate water supply; and possible GW usage restrictions	Not provided	$30,800 (capital) $0 (O&M)
III	Kane and Lombard, MD	09/30/87	1st	Soil, GW, and debris contaminated with VOCs, organics including PAHs and PCBs, and metals	67,000 yd^3	Removal of drums, hot spots, and 67,000 yd^3 soil with onsite soil capping; construction of subsurface containment/diversion system; development of SW run-off management facility; and future use of institutional controls	Chemical-specific cleanup levels will be addressed in 2nd O.U.	$4,692,660 (capital) $28,930 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Lackawanna Refuse Site, PA	03/22/85	1st-Final	SW and soil contaminated with VOCs, organics, and metals	Not provided	Excavation and offsite disposal of drums and highly contaminated fill; leachate collection and surface drainage diversion; clay capping and construction of gas venting systems; and reconstruction of access road	Excavation limits will be determined by background contaminant levels	$8,200,000 (capital) O&M (not provided)
III	Lansdowne Radiation, PA	08/02/85	1st	Dwellings contaminated with radioactive materials including radium	Not provided	Permanent relocation of residents	EPA guidelines for radiation include gamma 0.17 rem/yr, radon 0.03 WL, and soil activity 5-15 pCi/g	$1,500,000 (capital) $10,000 (annual O&M)
III	Lansdowne Radiation, PA	09/22/86	2nd	Dwellings and soil contaminated with radioactive materials including radium	Not provided	Demolition and offsite disposal of two homes; and excavation and offsite disposal of contaminated soil	EPA guidelines for radiation include gamma 0.17 rem/yr, radon 0.03 WL, and soil activity 5-15 pCi/g	$4,000,000- $4,500,000 (capital) "Minimal" (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Leetown Pesticide, WV	03/31/86	1st-Final	Soil and debris contaminated with pesticides	3,600 yd^3	Excavation, consolidation, and anaerobic biodegradation of contaminated soil; and removal and offsite disposal of contaminated debris	Target soil levels for DDT and its metabolites is 300 ug/kg, which is equivalent to the 10^{-6} carcinogenic risk level	$1,014,000 (capital) $10,000 (annual O&M) (year 1) $7,500 (annual O&M) (year 2)
III	Lehigh Electric, PA	02/11/83	1st-Final	Soil contaminated with VOCs and PCBs	Not provided	Excavation and removal of contaminated soil, transformers, and debris with offsite disposal of soil; demolition of onsite buildings; and backfilling, grading, and vegetation of site to minimize erosion and control runoff	Offsite disposal of soils with PCB concentration >50 mg/kg	$6,401,000 (capital) $46,000 (annual O&M)
III	Limestone Road, MD	09/30/86	1st	Soils, GW, SW, and sediment contaminated with VOCs including TCE and PCE, and metals	Not provided	Capping with grading and fencing	Not provided	$1,192,580 (capital) O&M (to be determined)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Matthews Electroplating, VA	06/02/83	1st-Final	GW and soil contaminated with metals including chromium	Not provided	Extension of existing municipal water system to affected residents	Not provided	$662,000 (capital) $292,000 (annual O&M)
III	McAdoo, PA	06/05/84	IRM	GW and soil contaminated with organics and inorganics	Not provided	Cleaning and removal of underground waste storage tanks; excavation and offsite disposal of visibly contaminated soil; and evaluation of analytical results of soil analyses	Not provided	$114,500 (capital) $0 (O&M)
III	McAdoo Associates, PA	06/28/85	2nd	GW, SW, and soil contaminated with paint sludges, spent solvents, metallic sludges, acid and caustic liquids, toluene, waste oil/water, and solid waste	Not provided	Removal and offsite disposal of the onsite tank, debris, and contaminated soil; limited excavation of soil; RCRA capping; SW diversion; and site covering	Excavation of soil "hot spots" which exceed cadimum 0.2 ug/kg, chromium 809 ug/kg, and cyanide 33 ug/kg	$2,360,000 (capital) O&M (not provided)
III	Middletown Road, MD	03/17/86	1st-Final	No threat	None	No action	Not provided	$0 (capital) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Millcreek Dump, PA	05/07/86	1st-Final	Soils, sediments, and GW contaminated with VOCs, organics including PCBs and PAHs, inorganics, and metals	Not provided	Excavation and onsite consolidation of soils under a RCRA cap with site grading and revegetation; soil capping over remaining soil; SW management; GW pump and treatment; and flood retention system	Soil cleanup goals include PCBs 10 mg/kg, PAHs 2,940 ug/kg, TCE 10 ug/kg, phenols 9,000 ug/kg, and toluene 1,783 ug/kg	$12,000,000 $18,000,000 ($15,000,000 estimated base-line) (capital) $1,763,000 (present worth O&M)
III	Moyer Landfill, PA	09/30/85	1st-Final	GW and SW contaminated with metals, VOCs including TCE, arsenic, and radioactive materials	Not provided	Soil/clay capping; erosion and sedimentation control measures; SW diversion; leachate collection, treatment, and discharge; methane gas recovery and sale; security/fencing measures; and RCRA closure	Not provided	$6,293,500 (capital) $332,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Palmerton Zinc, PA	09/04/87	1st	Defoliation of mountain side from zinc, lead, cadmium, and sulfur dioxide	Not provided	Onsite installation of concrete pad with berms to mix offsite sewage sludge and fly ash; application of lime (10 tons/acre) and potash (80 lbs/acre) on target areas; application of fly ash and offsite sludge on target areas; and application of grass seed, seedlings, and mulch	State loading rates for metals include cadmium 3.0 lbs/acre, copper 100.0 lbs/acre, chromium 100.0 lbs/acre, lead 100.0 lbs/acre, mercury 0.3 lbs/acre, nickel 20.0 lbs/acre, and zinc 200.0 lbs/acre. The maximum dry sludge application rate is 60 tons/acre	"Minimal" to none
III	Presque Isle, PA	09/30/87	1st-Final	None	Not applicable	No further action	Not provided	$0
III	Saltville Waste Disposal Ponds, VA	06/30/87	1st	Soil, sediments, SW, air, and biota contaminated with mercury	Not provided	Upgrading runon controls; treatment of waste pond outfall with either sulfide precipitation or carbon adsorption; and institutional controls to include possible implementation of local zoning ordinances	Treated effluent discharged into river will meet the State standard for mercury 0.05 ug/1 in water	$840,052-$2,143,052 (capital) $221,941-$258,941 (sulfide ppt. or carbon system, respectively) (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Sand, Gravel & Stone, MD	09/30/85	1st	GW, SW, soil, and sediments contaminated with organics and metals	Not provided	Excavation and offsite disposal of hazardous materials; and GW extraction and treatment with discharge to ponds, aquifer, or creek	GW will be treated to background levels for heavy metals and organic compounds	$7,095,000 (capital) $753,000 (annual O&M)
III	Taylor Borough, PA	06/28/85	1st	SW, soil, and sediments contaminated with VOCs including TCE, and organics	Not provided	Removal and offsite disposal of drums and remnants; SW collection and treatment; excavation and offsite disposal of contaminated soil, waste, and sediments from two of the former drum storage areas (areas 1 & 2) with backfilling and placement of a 24-inch soil cover over the remaining three former drum storage areas; and fencing	Excavation of sediments, soils, and wastes to background levels	$4,237,000 (capital) O&M (not provided)
III	Taylor Borough, PA	03/17/86	2nd-Final	Possible GW contamination with VOCs and metals	Not provided	No further action with semi-annual GW monitoring	Not provided	$0 (capital) $8,000 or $16,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	Tybouts Corner Landfill, DE	03/06/86	1st-Final	Soils and GW contaminated with VOCs including TCE, and inorganics	Not provided	Excavation of waste and soils with onsite consolidation and capping; and GW pump and treatment	GW will be treated to the cancer risk of 10^{-4} for carcinogens, which includes TVO 100 ug/l	FS estimate: $35,000,000 (capital) PRP estimate: $15,000,000 (capital) $4,600,000 (present worth O&M)
III	Tyson's Dump PA*	12/21/84	1st	GW, SW, soil, and stream sediments contaminated with VOCs	Not provided	Excavation and offsite disposal of contaminated soils and wastes; upgrading of the existing air stripping facility to treat leachate, shallow GW, and surface run-on; and excavation and offsite disposal of contaminated sediments	Not provided	$5,718,000 (capital) $351,000 (annual O&M)
III	Wade, PA	08/30/84	1st-Final	Soil contaminated with organics, metals, and inorganics	Not provided	Removal and offsite disposal of contaminated soil, tires, tankers, waste piles, and underground storage tanks; demolition of buildings, leveling of debris, filling and grading of property; and top soil and seed capping	Not provided	$1,580,050 (capital) $320,000 (annual O&M)

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* This ROD has been replaced by the amended ROD signed 3/31/88.

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
III	West Virginia Ordnance Works, WV	03/27/87	1st	Soil, sediments, and SW line contaminated with organics and asbestos	4,305 yd^3	In-situ flaming treatment of reactive nitroaromatic residue; capping of treatment residuals with nitroaromatic concentrations >50 mg/kg; excavation, flushing, and backfilling of reactive sewer lines; offsite disposal of asbestos; and institutional controls to include deed restrictions	Soil cleanup will attain less than the 10^{-6} individual lifetime cancer risk level. This sets the cleanup goal of total nitroaromatics at 50.0 mg/kg	$1,807,000 (capital) O&M (not provided)
III	Westline Site, PA	07/03/86	1st-Final	Soils contaminated with tars containing phenols and PAHs	710 yd^3	Excavation and offsite incineration of tar deposits; backfilling with clean soil; and GW verification study	Soils will be excavated to a 10^{-4} cancer risk level for contaminants present onsite, which is consistent with the 10^{-6} risk level for GW	$744,000 (capital) $0 (O&M)
IV	A.L. Taylor, KY	06/18/86	1st-Final	Soils, sediments, and SW contaminated with VOCs, PCBs, PAHs, and metals	Not provided	Excavation of soils, sediments, and sludge with onsite containment and capping	Not provided	$795,349 (capital) O&M (not provided)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	American Creosote, FL	09/30/85	1st	Soil contaminated with aromatic hydrocarbons	Not provided	Excavation and consolidation of contaminated soil from areas both on and off the site in an onsite RCRA landfill	Excavation of soils and sludges to MCLs including PAHs 12.0 mg/kg and benzene 0.13 mg/kg	$5,678,000 (capital) $50,000 (annual O&M) (years 1–5) $19,000 (annual O&M) (years 6–30)
IV	Biscayne Aquifer Site, FL	09/16/85	1st-Final	GW contaminated with VOCs	Not provided	Addition of air stripping to existing water treatment system; and operation of Miami Spring and Preston municipal wells	Cleanup goals based on EPA primary drinking water standards and the 10^{-6} cancer risk level have been identified for 50 priority pollutants	$5,268,000 (capital) $334,400 (annual O&M)
IV	Coleman Evans, FL	09/25/86	1st-Final	GW, soil, and sediments contaminated with VOCs, organics including PCP, and metals including chromium	9,000 yd^3	Excavation of PCP contaminated soils and sediments with onsite incineration; backfilling with decontaminated soil; GW recovery, storage and analysis; possible onsite GW treatment using carbon adsorption with discharge to surface	All soils containing PCP in excess of 10 mg/kg will be excavated. GW will be treated to levels which comply with Drinking Water Standards or Water Quality Criteria	$3,000,000–$3,800,000 (capital) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Davie Landfill, FL	09/30/85	1st	GW and sludge lagoon contaminated with organics, and inorganics including cyanide and sulfide	75,000 yd^3	Dewatering and stabilization of sludge lagoon contents and placement in single lined cell; and capping	Cleanup goals prevent exceedance of drinking water standards or the 10^{-6} cancer risk level	$3,000,000-$3,700,000 (capital) $100,000 (annual O&M)
IV	Distler Brickyard, KY	08/19/86	1st-Final	GW and soils contaminated with VOCs including TCE, metals, and inorganics	8,000 yd^3	Excavation and offsite disposal of all contaminated soil; backfilling with clean natural granular soils; and GW pump and offsite treatment at POTW with reinjection into the aquifer	GW will be treated and soil will be excavated to background levels	$7,500,000 (present worth) $1,568,000 (annual O&M) (years 1-2) $44,000 (annual O&M) (years 3-30)
IV	Distler Farm, KY	08/19/86	1st-Final	GW and soils contaminated with VOCs including TCE and PCE, metals, and inorganics	Not provided	Excavation and offsite disposal of all contaminated soil; backfilling with clean natural granular soil; and GW pump and offsite treatment at POTW with reinjection of uncontaminated water into the aquifer	GW will be treated and soil will be excavated to background levels	$11,138,400 (capital) $113,600 (annual O&M) (years 1-10) $20,000 (annual O&M) (years 11-30)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Gallaway Ponds, TN	09/26/86	1st-Final	Pond sediments contaminated with pesticides and inorganics	1,600 yd^3	Excavation of sediments with onsite consolidation; RCRA site closure; pond water dilution with discharge to tributary; and institutional controls	Pond water dilution will meet Ambient Water Quality Criteria	$344,735 (capital) $163,265 (present worth O&M)
IV	Geiger (C&M Oil), SC	03/27/87	1st	Soil and GW contaminated with VOCs, organics including PCBs, and metals	11,300 yd^3 62,000,000 gals	Excavation and onsite thermal treatment of soil followed by solidification/ stabilization with backfilling of excavated areas using grading and covering; and GW pump and treatment with discharge to SW	Specific preliminary goals for soil based on MCLs to include lead 166.5 mg/kg, chromium 3.7 mg/kg, benzene 14.4 mg/kg, trans-1,2-dichloroethylene 76.0 ug/kg, toluene 971.0 ug/kg, and PCB (Aroclor 1254) 1,050 ug/kg. GW will attain the cumulative 10^{-5} cancer risk level which includes MCL values for benzene 5.0 ug/l, toluene 175.0 ug/l, and lead 50.0 ug/l	$5,583,000 (capital) $367,200 (present worth O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Gold Coast, FL	09/11/87	1st-Final	Soil and GW contaminated with VOCs including TCE and PCE, and metals	1,500 yd^3 100,000 gals	Stabilization/ solidification of 1,000 yd^3 metal contaminated soil with onsite disposal and capping; excavation of 500 yd^3 soil and sludges with offsite disposal at a RCRA facility; GW pump and treatment (to be identified during design) with offsite discharge; and well closure	Soils will be excavated to the 10^{-4} health-based risk level which includes lead 100.0 mg/kg. GW treatment will attain MCLs for VOC contamination which include 1,1-dichloroethane 5.0 ug/l, methylene chloride 5.0 ug/l, trans-1,2-dichloroethylene 70.0 ug/l, tetrachloroethylene 3.0 ug/l, toluene 340.0 ug/l, and trichloroethylene 3.0 ug/l	$3,711,660 (capital)
IV	Hipps Road Landfill, FL	09/03/86	1st-Final	GW contaminated with VOCs including TCE, and metals	Not provided	GW pump and treatment at POTW; RCRA Subtitle D landfill closure; and institutional controls	GW will be treated to meet SDWA requirements, Water Quality Criteria Human Health Standards, or the 10^{-6} cancer risk	$3,900,000-$4,400,000 (capital) O&M (not provided)
IV	Hollingsworth, FL	04/10/86	1st-Final	GW and soil contaminated with VOCs including TCE	Not provided	Excavation, aeration and onsite replacement of VOC contaminated soil; and GW pump and treatment with reinjection into the aquifer	GW cleanup goals will be based on the 10^{-6} cancer risk level and State Drinking Water Standards	$653,730 (capital) $364,215 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Independent Nail, SC	09/28/87	1st	Soil and sediments contaminated with metals	6,200 yd^3	Excavation of metal contaminated soil and lagoon sediments with solidification/ stabilization; backfilling of treated soil; and covering	Soil will attain a 10^{-6} or less, cancer risk level which includes cadmium 2.6 mg/kg, chromium 5.3 mg/kg, cyanide 0.02 mg/kg, nickel 18.0 mg/kg, and zinc 1,785.0 mg/kg	$1,032,000 (capital) $22,500 (annual O&M) (years 1-2) $5,600 (annual O&M) (years 3-30)
IV	Lees Lane Landfill, KY	09/25/86	2nd-Final	GW, SW, and soil contaminated with VOCs, metals, and inorganics	212,400 tons	Removal of exposed drums and offsite disposal; capping of hot spots and exposed trash areas; gas collection and venting system; possible alternate water supply; bank stabilization; and institutional controls	ACLs will be developed from GW monitoring data	$2,343,000 (capital) $127,440 (annual O&M)
IV	Miami Drum Services, FL	09/13/82	1st	GW and soil contaminated with organics, pesticides, and metals	Not provided	Excavation and offsite disposal of soil; and treatment of GW encountered during excavation	Not provided	$1,568,660 (capital) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Mowbray Engineering, AL	09/25/86	1st-Final	Swamp soils contaminated with PCBs	4,800 yd^3	Excavation of PCB-contaminated soil with either onsite incineration, offsite incineration, or solidification/stabilization of the waste	Soils with 25 mg/kg PCBs or greater will be excavated and treated	$1,200,000-$2,000,000 (offsite incineration) (present worth) $1,100,000-$1,800,000 (onsite incineration) (present worth) $750,000 (solidification/stabilization) (present worth) $0 (O&M)
IV	Newport Dump, KY	03/27/87	1st	Soil and GW contaminated with organics including PCBs and PAHs, and metals	1,000,000 yd^3	Implementation of multimedia monitoring program; restoration and extention of leachate collection system; and restoration, regrading, and bank stabilization of existing clay cap with revegetation	PCBs, nickel, toluene, and other organics will be treated to the 10^{-6} health-based risk level. Barium and chromium will attain the MCL values of 1,000.0 ug/l and 50.0 ug/l, respectively	$516,000 (capital) $63,000 (annual O&M) (years 1-2) $35,000 (annual O&M) (years 3-30)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	N.W. 58th Street Landfill, FL	09/21/87	3rd-Final	GW contaminated with VOCs including TCE and PCE, and metals	27,000,000 yd^3	Landfill closure for all contaminated soil; controlling leachate generation through grading, drainage control, and capping; and provision of an alternate water supply to private well users east of landfill	The GW remedial action, as required in the 1985 ROD, will provide air stripping to bring contaminants into compliance with MCLs	$5,500,000 (capital) $1,500,000 (annual O&M)
IV	Palmetto Wood Preserving, SC	09/30/87	1st-Final	Soil and GW contaminated with metals	19,895 yd^3 10,500,000 gals	Excavation of contaminated soil with onsite flushing and backfilling of treated soil; pumping of wastewater to onsite treatment facility; GW pump and treatment with offsite discharge to SW; and installation of municipal waterline to affected residents or the drilling of new wells	Soil cleanup will attain public health evaluation levels which include chromium 627.0 mg/kg and arsenic 200.0 mg/kg. GW will attain MCL values which include chromium 50.0 ug/1, copper 1,000.0 ug/1, and arsenic 50.0 ug/1	$1,393,000 (capital) $176,163 (annual O&M)
IV	Parramore Surplus, FL	09/15/87	1st-Final	Possible contamination of GW with metals	Not applicable	No further action with monitoring of GW and SW	Cleanup standards to be reviewed as part of GW quality assessment include MCLs and WQC	$21,000 (capital) $19,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Powersville Landfill, GA	09/30/87	1st-Final	Soil and GW contaminated with VOCs, organics, pesticides, and metals	Not provided	Capping with grading; installation of monitoring wells and gas vents; provision for alternate water supply (extension of existing municipal water supply); and institutional controls including deed restrictions to restrict drilling or construction activities	Current contaminant concentration levels do not exceed SDWA	$4,000,000 (capital) $577,013 (present worth O&M)
IV	Pepper's Steel, FL	03/12/86	1st-Final	GW, soil, and sediments contaminated with organics including PCBs, and metals	PCB>1 mg/kg, approximatly 48,000 yd^3; lead> 1000 mg/kg, 21,500 yd^3; arsenic> 5 mg/kg, 9,000 yd^3 (waste quantities not additive)	Excavation, solidification/ stabilization, and onsite disposal of soil; collection and offsite disposal of free oil; and land use institutional controls	Excavation of soil exceeding PCB 1 mg/kg, lead 1000 mg/kg, and arsenic 5 mg/kg	$5,212,000 (capital) $42,500 (annual O&M)
IV	Pioneer Sand, FL	09/26/86	1st-Final	Soil and pond waters contaminated with VOCs, sludges, metals, and inorganics	Not provided	RCRA Subtitle D landfill closure; leachate collection, treatment, and onsite disposal; SW treatment and onsite discharge; and cover system for sludge and pond waste	Not provided	$462,025 (capital) $45,000 (O&M) (year 1) $34,900 (annual O&M) (years 2-30)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Sapp Battery, FL	09/26/86	1st-Final	GW, SW, soils, and sediments contaminated with metals	94,000 yd^3 (soil) 20,000 yd^3 (sediments)	Excavation, solidification/ fixation, and onsite disposal of solidified soil and sediments; GW pump and treatment; SW treatment and discharge; and assessment of potential institutional controls	Cleanup criteria for indicator chemicals were set based on Federal and State standards and risk-based levels	$14,318,544 (capital) $25,631 (annual O&M)
IV	SCRDI/Dixiana, SC	09/26/86	1st-Final	GW contaminated with VOCs including PCE, organics including PAHs and PCBs, inorganics, and pesticides	Not provided	GW pump and treatment with discharge to SW	GW will be treated to attain the ACL equivalent to 10^{-6} excess cancer risk	$751,250 (capital) $2,128,100 (annual (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Sodyeco, NC	09/24/87	1st-Final	Soil, SW, and GW contaminated with VOCs including TCE, and organics including PAHs	150 yd^3 (area D soil)	Excavation and incineration of 150 yd^3 of contaminated soil in area D and backfilling with clean soil; onsite treatment of contaminated soil in area C which may include flushing, soil washing, thermal processing, or in-situ steam stripping; capping of area 3 with asphalt; and GW pump and treatment with discharge to SW	Soil treatment will attain all ARARs following GW remediation. GW cleanup goals are based on MCLs, AWQC, MCLGs, NAAQ, and public health evaluation levels which include TCE 2.7 ug/l, PCE 0.8 ug/l, toluene 2,000.0 ug/l, xylene 440.0 ug/l, total PAHs 2.8 ng/l, chlorobenzene 60.0 ug/l, 1,2-DCE 400.0 ug/l, and ethylbenzene 680.0 ug/l	$2,089,000- $3,865,000 (present worth)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Tower Chemical, FL	07/09/87	1st	Soil and GW contaminated with pesticides and metals	4,000 yd^3 100,000,000 gals	Excavation and onsite thermal treatment of 4,000 yd^3 of soils and contaminated drum contents; decontamination of debris; residual analysis (if non-hazardous, backfill treated soil and debris onsite); GW pump and onsite treatment using filtration and activated carbon with offsite discharge to SW; installation of two individual treatment units for private wells; and institutional controls to include access restrictions	Soil cleanup goals will attain a 10^{-6} health-based risk level, which includes copper 100.0 mg/kg, lead 100.0 mg/kg, arsenic 5.0 mg/kg, and DDT 35.0 mg/kg. GW treatment will attain Florida Administrative Code levels, drinking water health advisory levels, 10^{-6} health based levels, and alternate concentration levels (based on 10^{-6} risk level), which include arsenic 0.05 ug/l, nickel 350.0 ug/l, chromium 0.05 ug/l, alpha-BHC 0.05 ug/l, chloroform 5.0 ug/l, DDT 0.01 ug/l, chlorobenzilate 1.0 ug/l, and dicoto 1.0 ug/l	$6,788,000 (capital) $0 (O&M)
IV	Tri-City Oil, FL	09/21/87	1st-Final	None	Not applicable	No further action	Contaminant concentration levels are below analytical detection limits	$0

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IV	Varsol Spill Site, FL	03/29/85	1st	None	Not provided	No further action	Not provided	$0
IV	Whitehouse Waste Oil Pits, FL	05/30/85	1st-Final	GW, SW, and soil contaminated with VOCs including benzene, metals including chromium, and organics including phenols and PAHs	Not provided	Slurry wall construction; GW pump and treatment; removal of contaminated sediments; and RCRA capping of the entire site	GW and SW quality should meet State primary drinking water standards. Soil and sediments will be removed to background or "minimal" risk levels	$3,049,000 (capital) $96,630 (annual O&M)
V	A&F Materials-Greenup, IL	11/23/83	IRM	GW and soil contaminated with organics including PCBs, metals, and inorganics	Not provided	Removal and offsite disposal of contaminated tank liquids and drum wastes; and temporary capping of lagoons	Not provided	$111,000 (capital) O&M (not privided)
V	A&F Materials Company, IL	06/14/85	2nd	Soil and SW contaminated with organics including PCBs, and metals	Not provided	Removal and offsite disposal of all contaminated soil; cleaning and removal of onsite equipment and buildings; soil testing beneath the building with disposal if above recommended action levels; site grading; and removal of site fencing	Soil >1 mg/kg PCBs will be removed. Other Action Levels for key contaminants include benzene 1 ug/gm, toluene 12 ug/gm, trichlorethylene 1 ug/gm, chromium 80 ug/gm, and cadmium 5 ug/gm	$824,000 (capital) O&M (not provided)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	A&F Materials, IL	08/14/86	3rd-Final	GW contaminated with VOCs including TCE, inorganics, and metals	Not provided	GW monitoring with installation of additional monitoring wells; and institutional controls	Not provided	PRP responsibilty
V	Acme Solvents, IL	09/27/85	1st	GW and soil contaminated with organics including PCBs, VOCs including TCE, and inorganics	Not provided	Provision for interim alternate water supply system by installation of home carbon treatment units; and excavation and offsite disposal of non-incinerable wastes and incineration of other waste materials and soils	Not provided	To be determined
V	Arcanum Iron & Metal, OH	09/26/86	1st-Final	GW, SW, soil, and sediments contaminated with inorganics including lead, antimony, and arsenic	Onsite soils with >500 mg/kg lead, 20,000 yd^3; battery casing chips, 3,800 yd^3; offsite soils not specified	Excavation and offsite disposal of soil with >500 mg/kg lead; excavation and onsite disposal of soil with lead between background and 500 mg/kg; removal of battery casings; conduction of treatability studies and onsite landfilling; and deed restrictions on land and aquifer usage	Soil cleanup goals based on CDC Acceptable Daily Intake levels including offsite disposal of lead >500 mg/kg and onsite disposal of lead between background and 500 mg/kg. Excavation of offsite soils will be conducted until background levels are reached	$9,929,000 (capital) $37,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Arrowhead Refinery, MN	09/30/86	1st-Final	GW, SW, soil, and sediments contaminated with VOCs, organics including PAHs, and metals including lead	4,600 yd^3 (sludge) 20,500 yd^3 (soil and sediments)	Excavation and onsite incineration of contaminated soil, sediments, and sludge; GW pump and treatment; and extension of municipal water supply system to affected residents	Soils and sediments will be excavated and treated to achieve a 10^{-6} excess cancer risk level. GW treatment will also achieve the 10^{-6} level	$22,000,000 (capital) $130,000-$180,000 (annual O&M)
V	Berlin & Farro, MI	02/29/84	1st	SW, soil, and air contaminated with VOCs, and organics including PCBs	Not provided	Excavation of contaminated landfill, drum, and soil areas; separation of PCB and non-PCB wastes with offsite disposal; offsite incineration of liquid wastes and landfilling of solid wastes; and backfilling or capping of site	Not provided	Not provided
V	Burlington Northern, MN	06/04/86	1st-Final	GW and soil contaminated with organics	9,500 yd^3	Excavation and onsite aerobic breakdown and transformation of contaminated soils and sludges; and onsite RCRA capping	Possible goals are to achieve detoxification of soils as defined by the microtox test and achieve total PAH and benzene extractable concentrations in the treatment zone equal to or less than concentrations present in the soil left in place	$582,000 (capital) $36,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Burrows Sanitation, MI	09/30/86	1st-Final	GW, SW, soil, and sediments contaminated with metals, and inorganics including cyanide	250 yd^3	Excavation, solidification/ fixation, and offsite disposal of metal hydroxide sludges; and GW pump and treatment	GW cleanup based on current lowest regulated concentrations for each indicator chemical. Criteria will be taken from the SDWA, Acceptable Chronic Intake Levels, and Health Advisories. Soil cleanup will be based on the site-specific Endangerment Assessment	$1,256,700 $1,335,400 (depending on distance to offsite RCRA facility) (capital) $115,000 (annual O&M)
V	Byron/Johnson Salvage, IL	03/13/85	1st	Soil contaminated with VOCs, organics including PCBs, and metals including lead and arsenic	Not provided	Excavation and offsite disposal of drums; offsite RCRA disposal of EP toxic soils and, if possible, incineration or treatment of liquids; and in-situ treatment of cyanide contaminated soil	Remedy consists of treatment of soil that exceeds 100 times the drinking water standard, and onsite treatment of soil containing 71 mg/kg amenable cyanide	$1,170,919 (capital) $6,000 (annual O&M)
V	Byron/Johnson Salvage Yard, IL	09/23/86	2nd	GW contaminated with VOCs including TCE, metals, and inorganics including cyanide	Not provided	Provision of home carbon treatment units and bottled water as an interim alternate water supply	Remedy will comply with 10^{-6} cancer risk levels for suspected carcinogens	$115,500 (capital) $165,300 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Cemetery Dump, M	09/11/85	1st	GW and soil contaminated with VOCs, and organics including PCBs	Not provided	Excavation and offsite RCRA disposal of 250 drums	Not provided	$1,883,261 (capital) O&M (not provided)
V	Charlevoix, MI	06/12/84	IRM	GW contaminated with VOCs including TCE and PCE	Not provided	Provision for a permanent alternate water supply	Not provided	$1,954,000 (capital) $118,000 (annual O&M)
V	Charlevoix, MI	09/30/85	2nd-Final	GW contaminated with VOCs including TCE and PCE	Not provided	Plume discharge to Lake Michigan under natural flow conditions; long-term plume monitoring; and institutional controls on private well installation	Under natural flow conditions, TCE and PCE will meet 0.008 ug/l and 0.01 ug/l, respectively	$0 (capital) $17,000 (annual O&M)
V	Chem-Dyne, OH	07/05/85	1st-Final	GW and soil contaminated with VOCs, organics including PCBs, and metals	Not provided	GW pump and treatment; demolition of onsite buildings; removal of selected soil; and RCRA capping	GW will be treated to <100 ug/l total VOCs to meet background levels, or 10^{-6} cancer risk level	$11,600,000 (capital) $597,000 (annual O&M)
V	Cross Brothers, IL	03/25/85	IRM	Soil contaminated with VOCs	Not provided	Excavation and offsite disposal of surficial and buried waste materials, and visibly contaminated soil	Not provided	$377,728 (capital) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Eau Claire, WI	06/10/85	IRM	GW contaminated with VOCs including PCE	11,200,000 gal/day	GW treatment using air stripping with discharge to municipal water treatment plant and distribution system	Aeration treatment will remove 99.6% 1,1-dichloroethene from GW	$1,420,000 (capital) $195,000 (annual O&M)
V	Envirochem, IN	09/25/87	1st	Soil, sediments, SW, and GW contaminated with VOCs, organics including PCBs, and inorganics	4,200 yd^3	Excavation, dewatering, and onsite disposal of soils and sediments under a RCRA multi-layer cap; re-routing of SW; GW collection and treatment; and institutional controls to include deed and access restrictions	GW will attain MCL values which include benzene 5.0 ug/l, 1,1-DCE 7.0 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, and TCE 200.0 ug/l	$33,900,000 present worth)
V	Fields Brook, OH	09/30/86	1st	Brook sediments contaminated with VOCs including TCE and PCE, organics including PCBs, and metals	36,000 yd^3 16,000 yd^3	Excavation, solidification, and onsite disposal of contaminated sediments Excavation and thermal treatment of contaminated sediments with onsite disposal of residuals	Sediments will be excavated to a 10^{-6} excess cancer risk or to 50 mg/kg PCBs, whichever is greater	$35,100,000 (capital) $72,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	FMC, MN	09/30/87	1st-Final	GW contaminated with VOCs including TCE	Not provided	GW extraction with discharge of untreated GW to POTW; and institutional controls to include land use restrictions to mitigate against near-term contaminated GW usage	GW treatment will attain a 10^{-6} health-based risk level and meet the MCLs for 1,2-DCA 5.0 ug/1, 1,1,1-TCA 200 ug/1, TCE 5.0 ug/1, PCE 10.0 ug/1, 1, 1-dichloro-ethylene 7.0 ug/1, and benzene 5.0 ug/1. Minnesota Recommended Drinking Water Limits will be met for 1,1,2-TCA 6.1 ug/1, 1,2-DCE 7.0 ug/1, toluene 2,000.0 ug/1, and xylene 440.0 ug/1	$1,518,005 (present worth)
V	Forest Waste, MI	02/29/84	IRM	Soil contaminated with organics including PCBs	Not provided	Fencing	Not provided	$100,000 (capital) $0 (O&M)
V	Forest Waste, MI	06/30/86	1st	Soils and sediments contaminated with organics and metals	4,000 yd^3 110,000 gals	Excavation of sludges and sediments and removal of aqueous lagoon wastes with solidification and offsite RCRA disposal	Cleanup levels will achieve an ingestion rate of 0.1g/day of soil for a 70 kg adult	$1,295,000 (capital) $0 (O&M)
V	Industrial Excess Landfill, OH	09/30/87	1st	GW contaminated wth VOCs, organics, and inorganics	Not provided	Provisions of an alternate water supply to approximately 100 homes	Chemical-specific cleanup goals will be selected in 2nd O.U.	$1,715,870-$2,289,060 (present worth)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Johns-Manville, IL	06/30/87	1st-Final	Soil, SW, GW, and air contaminated with inorganics including asbestos	Not provided	Grading and covering waste materials and soil in inactive water disposal areas; closure of asbestos pit cover; offsite disposal of asbestos-containing material generated from reconstruction activities following final closure of disposal pit in FY89; and SW, GW, and air monitoring system	All media will attain NESHAP requirements for asbestos	$4,026,000 (capital) $49,000 (annual O&M)
V	Kummer Landfill, MN	06/12/85	1st	GW contaminated with VOCs	Not provided	Provision for an alternate water supply	Remedy will reduce cancer threat to $<10^{-6}$ risk level	$1,624,850 (capital) $28,440 (annual O&M)
V	Lake Sandy Jo, IN	09/26/86	1st-Final	SW, soils, and sediments contaminated with VOCs, organics including PAHs, and metals	2,500 yd^3	Soil capping; alternate water supply; onsite consolidation of sediments; and institutional controls including deed restrictions on aquifer usage	Sediments with contaminants above the 10^{-6} risk level will be excavated and consolidated	$4,747,000 (capital) $63,000 (annual O&M)
V	LaSalle Electrical, IL	08/29/84	1st	Offsite soils contaminated with VOCs, and organics including PCBs	25,530 yd^3	Excavation and onsite incineration of offsite soils	Excavation and incineration of soils with greater than 5 mg/kg PCBs in the first 12 inches of soil, and greater than 10 mg/kg in soils at depths below 12 inches	$26,400,000 (present worth) $0 (O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Laskin Poplar Oil, OH	08/09/84	1st	SW and soil contaminated with VOCs, and organics including PCBs and PAHs	Not provided	Incineration of contaminated waste oil; and treatment of contaminated waste water	Not provided	$1,043,000 (capital $0 (O&M)
V	Laskin Poplar Oil, OH	09/30/87	2nd	Soils, oil waste water, and sludge contaminated with VOCs, organics including PCBs and PAHs, and inorganics	900,000 yd^3 771,000 gals	Onsite incineration of oils, sludges, and soils with offsite disposal of all incinerator ash; offsite treatment of waste water; decontamination of water and scrubber water; dismantling and offsite disposal of all tanks; crushing and incineration of pit cinder block walls; and backfilling and/or grading of all excavated areas	Selection of cleanup levels are scheduled in FY88	$8,490,865 (capital) $0 (O&M)
V	LeHillier/Mankato, MN	09/27/85	1st-Final	GW and soil contaminated with VOCs including TCE	Not provided	GW pump and treatment using air stripping; extension of LeHillier water supply system to affected areas; and abandonment of contaminated wells	The goal of plume extraction and treatment is consistent with the 10^{-6} cancer risk concentration for TCE 2.8 ug/l	$800,000 (capital) $70,0000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Liquid Disposal, MI	09/30/87	1st-Final	Soil and GW contaminated with VOCs, organics including PCBs, and inorganics	Not provided	Onsite land disposal of all debris and equipment; onsite solidification/fixation of soil and waste; construction of a slurry wall and impermeable cap containment system; and GW pump and treatment using air stripping and ion exchange with discharge to SW	Target cleanup levels (TCLs) for soil and GW will be based on 10^{-6} health-based risk level. For noncarcinogens in GW, MCLs and health-based levels were used as TCLs which include barium 1000.0 ug/l, cadmium 10.0 ug/l, chloroform 0.1 ug/l, benzene 0.2 ug/l, methylene chloride, 1.0 ug/l, and TCE 0.8 ug/l. TCL soil cleanup goals include TCE 77.0 ug/g, PCE 16.0 ug/g, benzo(a)pyrene 0.4 ug/g, PCBs 1.0 ug/g, and lead 20.0 ug/g	$21,743,100 (capital) $316,600 (present worth O&M)
V	Main Street, IN	08/02/85	1st	GW contaminated with VOCs including TCE and PCE	Not provided	GW treatment using air stripping with discharge to water treatment system and drinking water distribution system	The air stripping system is designed to achieve a 99.1% removal of TCE, 88.9% removal of PCE, and 96.7% removal of 1,1-DCE	$1,106,000 (capital) $158,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Marion-Bragg Landfill, IN	09/30/87	1st-Final	Soil, SW, and GW contaminated with VOCs, organics including PAHs, and inorganics	1,100,000 yd^3	Regrading and capping of site; provision for maintaining flood control measures; construction and maintenance of perimeter fence; provision of three private use drinking water wells; and additional GW studies, as necessary	Selection of appropriate GW cleanup levels deferred until selection of GW treatment O.U.	$5,800,000 (capital) $1,000,000 (present worth O&M)
V	Metamora Landfill, MI	09/30/86	1st	GW and soil contaminated with VOCs including TCE and PCE, and metals	18,150 yd^3	Excavation and offsite thermal destruction of wastes from areas 1 and 4	GW and soil cleanup targets will be established in the FY88 RI/FS	$41,500,000 (present worth) $0 (O&M)
V	Morris Arsenic, MN	08/07/85	1st-Final	None	None	No further action	Not provided	$0
V	New Brighton, MN (Interim Water Treatment)	06/24/83	IRM	GW contaminated with VOCs including TCE	Not provided	Interim GW treatment using granular activated carbon and air stripping	Not provided	$150,400 (capital) $30,526 (annual O&M)
V	New Brighton, MN (Water Supply System)	09/19/83	IRM	GW contaminated with VOCs including TCE	Not provided	Extension of existing public water supply system to affected residents	Not provided	$217,958 (capital) O&M (not provided)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	New Brighton, MN (Water Supply System)	08/02/84	IRM	GW contaminated with VOCs	Not provided	Extension of existing public water supply system to replace contaminated municipal system	Not provided	$142,090 (capital) O&M (not provided)
V	New Brighton/ Arden Hills/ St. Anthony, MN	06/30/86	4th	GW contaminated with VOCs including TCE and PCE, and organics	Not provided	Provision of alternate water supply through well construction	Not provided	$600,500 (capital) $22,820 (annual O&M)
V	New Brighton/ Arden Hills/ St. Anthony, MN	03/31/87	5th	GW contaminated with VOCs including TCE and PCE	Not provided	Construction of granular activated carbon (GAC) water treatment facilities with discharge to the municipal water treatment plant; and construction of a pipeline from wells to the treatment facilities	GW treatment will attain the MCL for TCE of 5.0 ug/l. MCLs for other VOCs have not been exceeded	$1,100,500 (capital) $160,770 (annual O&M)
V	New Brighton/ (TCAAP), MN	09/25/87	3rd	GW contaminated with VOCs and metals	Not provided	GW pump and treatment with air stripping and onsite reinjection to aquifer	GW cleanup goals will attain 10^{-6} health based levels. Discharged water will, at a minimum, meet MCL values which include benzene 5.0 ug/l, toluene 2,000.0 ug/l, TCE 5.0 ug/l, PCE 6.9 ug/l, vinly chloride 2.0 ug/l, xylene 440.0 ug/l, arsenic 50.0 ug/l, and chromium 50.0 ug/l	$4,000,000 (capital) $120,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	New Lyme Landfill, OH	09/27/85	1st-Final	GW, soil, and sediments contaminated with VOCs, organics, and inorganics including asbestos	Not provided	Capping; installation and operation of extraction/containment wells to dewater landfill and eliminate leachate; onsite GW and leachate treatment using biological disc, sodium hydroxide precipitation, and granular activated carbon; onsite consolidation of contaminated sediment; and fencing	Not provided	$10,798,000 (capital) $44,000 (annual O&M)
V	Northern Engraving, WI	09/29/87	1st-Final	Soil, sludge, and GW contaminated with VOCs including TCE, and inorganics	4,400 yd^3	Excavation and onsite solidification of sludge and soil; installation of RCRA cap atop lagoon; and institutional controls to include deed and access restrictions to seepage pit	GW cleanup will be managed through the use of ACLs that are protective of the river. ACLs include TCE 21,900.0 ug/1, copper 12.0 ug/1, nickel 160.0 ug/1, and zinc 110.0 ug/1	$295,000 (capital) $16,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Northernaire, MI	09/11/85	1st	GW, soil, and sewer sediments contaminated with metals including chromium and cadmium	Not provided	Excavation and offsite disposal of soil and sewer line to privately-owned RCRA facility; cleaning dust and hazardous residue from building floor; breaking up of 300 ft^2 of floor and drywell, sampling soil, excavation, and disposal of any contaminated debris and soil at a RCRA Subtitle C facility; and backfilling of area with clean soil	Excavation of soils and sediments will meet response objectives of chromium 50 mg/kg and cadmium 10 mg/kg	$75,000 (capital) $0 (O&M)
V	Northside Landfill, IN	09/25/87	1st	Soil, sediments, SW, and GW contaminated with VOCs including TCE, organics including PCBs, and inorganics	4,200 yd^3	Excavation, dewatering, and onsite disposal of soils and sediments under a RCRA multi-layer cap; re-routing of SW; GW and leachate collection and treatment system; and institutional controls to include deed and access restrictions	GW will attain MCL values which include benzene 5.0 ug/l, 1-1-DCE 7.0 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, and TCE 200.0 ug/l	$33,900,000 (present worth)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Novaco Industries, MI	06/27/86	1st	GW contaminated with metals including chromium	36,000,000 gals	GW pump and treatment using electrochemical reduction, precipitation, filtration, and ion exchange with discharge to creek; and GW extraction from the sand/gravel aquifer	Treatment will remove hexavalent chromium from the GW to concentrations below 50 ug/l and trivalent chromium concentrations to below 100 ug/l	$560,000 (capital) $419,000 (annual O&M) (years 1-6)
V	Old Mill, OH	08/07/85	1st-Final	GW and soil contaminated with VOCs and organics including PCBs	Not provided	Removal and offsite disposal of 95 percent of soil contaminants; GW extraction and treatment using granular activated carbon; aquifer use restrictions; and provision of public water supply to residences potentially affected	Soils contaminated with base/neutral compounds will be removed to background, and VOC removal will be to the 10^{-6} cancer risk level. GW cleanup has been proposed to meet the 10^{-5} risk level	$3,917,000 (capital) $45,000 (annual O&M)
V	Outboard Marine Corp., IL	05/15/84	1st	GW, soil, and river sediments contaminated with VOCs, and organics including PCBs	Not provided	Excavation and offsite disposal of PCB contaminated materials; construction of onsite containment cell for moderately contaminated PCB material; capping; GW diversion; construction of clay-lined dewatering lagoon; and treatment of supernatant with discharge to harbor	Not provided	$21,570,000 (present worth) O&M (not provided)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Reilly Tar, MN	06/06/84	1st	GW contaminated with VOCs and organics including PAHs	Not provided	GW treatment using granular activated carbon	Not provided	$750,000 (capital) $188,000 (annual O&M)
V	Reilly Tar & Chemical, MN	05/30/86	2nd	GW and soils contaminated with VOCs, and organics including PAHs	800,000 - 1,000,000 yd^3	GW pump and treatment; capping and filling of exposed wastes; and discharge of hazardous waste to sewer	Drinking water criteria for PAHs were developed through State and EPA consultations	Cost estimates not fully developed
V	Rose Township, MI	09/30/87	1st-Final	Soil and GW contaminated with VOCs, organics including PCBs and PAHs, and inorganics	50,000 yd^3	Excavation of soil and onsite thermal destruction with disposal of ash as either backfill or placement in an offsite RCRA facility (if ash is EP toxic, leachable lead removal treatment will be required); GW pump and treatment using chemical coagulation, air stripping, and activated carbon adsorption with discharge in appropriate manner; and fencing	Cumulative soil cleanup will attain 10^{-6} cancer risk level which includes arsenic 14.0 mg/kg, PCBs 10.0 mg/kg, and lead 70.0 mg/kg. GW levels will also attain the 10^{-6} cancer risk level which includes vinyl chloride 0.015 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, chlorobenzene 60.0 ug/l (proposed MCLG), benzene 0.133 ug/l, TCE 0.627 ug/l, PCBs 0.002 ug/l, and methylene chloride 0.919 ug/l	$32,547,000 (capital) $200,000 (annual O&M) (years 1-10) $70,000 (annual O&M) (years 10-30)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Schmalz Dump, WI	08/13/85	1st	Soil contaminated with VOCs, organics including PCBs, and metals including chromium	3,500 yd^3	Excavation and offsite disposal of contaminated building debris and sediments with dewatering	PCBs will be removed in the dewatering process to below 0.5 ug/kg	$2,088,300 (capital) $0 (O&M)
V	Schmalz Dump, WI	09/30/87	2nd-Final	Soil contaminated with metals	Not provided	Installation of a low permeability, compacted earth material cap over approximately seven acres of soil	Trivalent chromium does not exceed the MCL (50.0 ug/1) and lead was not reported above detection units	$687,664 (capital) $17,940 (annual O&M)
V	Seymour, IN	09/30/86	1st	GW and soil contaminated with VOCs, organics, and metals	101,690,000 gals	GW extraction and treatment with discharge to POTW	Water discharge will conform with POTW standards	$300,000 (capital) $100,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Seymour Recycling, IN	09/25/87	2nd-Final	Soil, sediments, and GW contaminated with VOCs including TCE, and organics	3,000 yd^3	Implementation of a full scale soil vapor extraction system; installation of a multimedia cap; excavation of contaminated sediments and consolidation of sediments beneath cap; GW pump and treatment; and institutional controls to include deed and access restrictions with compliance point at the edge of the cap	GW cleanup levels will attain a cumulative 10^{-5} to 10^{-6} cancer risk level. MCLs attributing to this level include benzene 5.0 ug/l, chloroform 100.0 ug/l, 1,2-DCE 7.0 ug/l, TCE 5.0 ug/l, and vinyl chloride 2.0 ug/l. GW cleanup levels for inorganics will meet chronic health values including lead, cadmium, and barium 50.0 ug/l each	$10,536,000 (capital) $7,200,000 (present worth O&M)
V	Spiegelberg Landfill, MI	09/30/86	1st	GW and soils contaminated with VOCs, organics, and metals	5,000 yd^3 10,000 yd^3	Excavation of waste materials with offsite incineration of liquid paint sludges and offsite disposal of solid paint sludges	Excavation of all materials exceeding a 10^{-6} excess cancer risk	$15,771,000-$18,395,000 (capital) $0 (O&M)
V	Verona Well Field, MI	05/01/84	IRM	GW and air contaminated with VOCs including TCE and PCE	Not provided	Provision for new wells; implementation of barrier system; treatment of purge water using air stripping system; and treatment of air emissions using activated carbon adsorption	Not provided	$1,796,000 (capital) $470,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
V	Verona Well Field, MI	08/12/85	2nd	GW and soil contaminated with VOCs including TCE and PCE	Not provided	Soil treatment using enhanced volatilization; and GW pump and treatment using existing air stripper	It is estimated that within three years, GW contamination will decrease to 100 ug/l VOCs	$1,660,000 (capital) $90,000 (annual O&M) (years 1-2) $46,000 (annual O&M) (years 3-30)
V	Wauconda Sand & Gravel, IL	09/30/85	1st	GW, SW, and soil contaminated with VOCs, organics including PCBs, and metals	Not provided	Installation of leachate collection drains; provision for leachate disposal at sewage treatment plant or at an offsite hazardous waste treatment facility; regrading with clean soil cover and revegetation of bare and eroded areas; and fencing	Not provided	$1,600,000 (capital) $50,000 (annual O&M)
VI	Bayou Bonfouca, LA	08/15/85	1st	GW, soil, and sediments contaminated with creosote	Not provided	Offsite disposal of creosote waste	Not provided	$903,000 (capital) $173,743 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	Bayou Bonfouca, LA	03/31/87	2nd-Final	Soil, sediments, and potentially GW, contaminated with organics including PAHs	71,500 yd^3	Excavation and onsite incineration of 51,500 yd^3 of soil, sediment, and sludge with onsite disposal of ash and capping (20,000 yd^3, 34 acres); and GW pump and treatment using technologies to be evaluated during design with reinjection	Soil/sediment contamination > 1,300 mg/kg PAHs will be treated. Soil/sediment contamination >100 mg/kg PAHs will be capped. GW treatment will target the 10^{-4} to 10^{-7} cancer risk level (CWA suggests 3.1 ng/l level for PAHs). Point of compliance is facility property line	$59,594,534 (capital) $173,748 (annual O&M)
VI	Bayou Sorrel, LA	11/14/86	1st-Final	Soil and GW contaminated with pesticides, VOCs, organics, and inorganics	36,400 yd^3	Regrading with top soil; RCRA geomembrane/clay capping of former disposal areas; installation of sand/geofabric pore water drainage layer; installation of a venting system to reduce buildup of gases beneath cap; installation of slurry wall; consolidation of all miscellaneous wastes for grading, fill or offsite disposal; fencing of all capped areas; and construction of gravel access roads around fenced areas	Chemical-specific cleanup levels not provided	$23,200,000 (capital) $5,700,000 (present worth O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	Bio-Ecology Systems, TX	06/06/84	1st-Final	Soil and SW contaminated with VOCs including TCE, organics including PCBs, and metals	Not provided	Construction of onsite disposal cell with synthetic liner, leachate collection system, and final cover; stabilization of waste and onsite placement in cell; elevation of site above 100-year flood plain; and fencing	Not provided	\$3,709,600 (capital) \$20,000 (annual O&M)
VI	Cecil Lindsey, AR	04/23/86	1st-Final	None	Not provided	No further action with site access restrictions and GW monitoring	Not provided	\$61,000 (capital) \$10,000 (annual O&M)
VI	Cleve Reber, LA	03/31/87	1st	Soil, SW, GW, and debris contaminated with organics	6,400 drums 220,000 yd^3 500,000 gals	Excavation and onsite incineration of buried drums and sludges; RCRA capping on land used for disposal of industrial hazardous waste; installation of gas venting pipes; drainage and backfilling of onsite ponds; pond water pump and treatment with discharge to SW; and fencing	Remediation will attain the 10^{-6} cancer risk level through CWA water quality criteria. Specific cleanup goals include hexachlorobutadiene 0.45 ug/l, hexachlorobenzene 21.0 ng/l, and hexachloroethane 2.4 ug/l. Specific excavation and treatment levels not provided	\$25,000,000 (capital) \$100,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	Compass Industries Landfill, OK	09/29/87	1st-Final	Soil and GW contaminated with organics and inorganics	620,000 yd^3	RCRA capping with site grading; SW diversion; fencing with warning signs along cap perimeter; and GW extraction and onsite treatment in upper perched water-bearing zone	GW solid effluent levels will meet NPDES requirements. Other chemical specific levels not provided	$9,255,526 (capital) $272,830 (annual O&M)
VI	Crystal Chemical, TX	09/17/85	NDD					$2,078,000 (capital) $63,000 (annual O&M)
VI	Crystal City Airport, TX	09/29/87	1st-Final	Soil and debris contaminated with pesticides and inorganics	12,000 yd^3	Onsite consolidation of all materials which exceed 100 mg/kg total pesticides; RCRA capping over consolidation cell; and disposal of decontamination liquids	Soil cleanup will attain 10^{-6} health based cancer risk level for total pesticides >100.0 mg/kg. Debris cleanup will be based on visible inspection	$1,600,000 (present worth)
VI	Geneva Industries, TX	09/18/86	1st-Final	GW and soils contaminated with VOCs including TCE, and organics including PAHs and PCBs	22,500 yd^3	Excavation and offsite disposal of contaminated soil and drums; capping; and GW pump and treatment using carbon adsorption with discharge to adjacent flood control channel	Soil will be excavated to PCBs 100 mg/kg. GW will be treated to below TCE 1 ug/l	$14,990,000 (capital) $532,000 (annual O&M) (years 1-2) $483,000 (annual O&M) (years 3-30)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	Gurley Pit, AR	10/06/86	1st	Soil and sediments contaminated wth organics including PCBs; pit sludge/ sediments contaminated with oily waste and metals	432,470 ft^3 (soil, sludge, sediments) 4,100,000 gals	Excavation and stabilization of sludge, soil, and sediment with placement in onsite RCRA landfill; removal of oil from water by oil/water separation with incineration of oil; treatment of pond water with discharge to bayou; and removal of pond water solids to be disposed with pit sludge	Remedy meets RCRA, CAA, NAAQ, and TSCA criteria for PCBs. Specific levels were not provided. Treated pond water discharges comply with NPDES permit requirements	$5,780,000 (capital) $21,000 (annual O&M)
VI	Hardage/Criner, OK	11/14/86	1st	Soil, GW and debris contaminated with VOCs including TCE and PCE, organics including PCBs, and inorganics	180,000 yd^3 10,000-20,000 (drums)	RCRA capping; installation of leachate collection system; excavation of sludge, drum mounds, and main pit; temporary capping of former source areas (interim measures); onsite or offsite physiochemical treatment of inorganic liquids with discharge to POTW; and treatment of solids by technology to be identified during design. GW remediation to be addressed in future O.U.	Soil and GW cleanup levels will be addressed in 2nd O.U.	$68,014,000 (capital) $2,282,000 (present worth O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	Highlands Acid Pit, TX	06/25/84	1st	GW, soil, and sludge contaminated with VOCs, organics, and metals	Not provided	Excavation and offsite disposal of waste material; backfilling and seeding; and fencing	Not provided	$2,407,000 (capital) $14,100 (annual O&M)
VI	Highlands Acid Pit, TX	06/26/87	2nd-Final	Possible contamination of SW and GW with VOCs and metals	Not applicable	No further action with SW and GW monitoring	Contaminant concentration levels meet WQC and MCL requirements	$4,700 (capital) $11,120 (annual O&M) (year 1) $6,980 (annual O&M) (years 2-30)
VI	Mid-South, AR	11/14/86	1st	Soil, sediments, SW, and GW contaminated with organics including PAHs, and inorganics	45,750 yd^3	Excavation of soil with consolidation and capping; consolidation and stabilization of oils, liquids, or sludge; RCRA capping; backfilling, grading and seeding (or gravel cover) of all excavated areas; fencing; institutional controls to include deed restrictions; and GW pump and treatment using carbon filtration with discharge to SW	Cleanup goals for all media are based on Public Health Evaluation levels or concentrations that exceed background levels. Specific soil goals based on the 10^{-5} health-based risk level include total PAHs 3.0 mg/kg, arsenic 5.6 mg/kg, and chromium 19.4 mg/kg	$3,500,000 (capital) $153,500 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	MOTCO, TX	03/15/85	1st	Soil and SW contaminated with organics including PCBs	Not provided	Offsite biological treatment of contaminated pit water; offsite TSCA incineration of organic liquids; and offsite RCRA disposal of sludges/tars and soils	Not provided	$42,300,000 (capital) O&M (not provided)
VI	Odessa Chromium I, TX	09/08/86	1st	GW contaminated with metals including chromium	Not provided	Negotiating agreements with Odessa City to extend water supply; and construction of water distribution system	Not provided	$247,920 (capital) $14,350 (annual O&M)
VI	Odessa Chromium II, TX	09/08/86	1st	GW contaminated with metals including chromium	Not provided	Extension of municipal water service to affected areas	Not provided	$476,570 (capital) $51,375 (annual O&M)
VI	Old Inger, LA	09/25/84	1st-Final	GW and soil contaminated with VOCs, pesticides, and metals	Not provided	Onsite land treatment of heavily contaminated soil and sludges; onsite containment and capping of slightly contaminated soils; closing and sealing ungrouted onsite well; GW pump and treatment; and fluid treatment with offsite discharge	Not provided	$3,174,000 (capital) $10,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	Petro-Chemical Systems, TX	03/27/87	1st	Soil contaminated with VOCs, and organics including PAHs	4,000 yd^3	Excavation and temporary storage of soil in an onsite RCRA facility; construction of a road over excavated areas and existing roadway to provide access to site area; and temporary relocation of residents during excavation	Soil will be excavated to below PAHs 100.0 mg/kg or total volatiles 100.0 mg/kg	$1,232,785 (capital) $4,750 (annual O&M)
VI	Sand Springs Petrochemical Complex, OK	09/29/87	1st	Soil, surface liquids, and sludges contaminated with VOCs, organics, and inorganics	130,000 yd^3 715,000 gal	Solidification/stabilization of sludges with containment in an onsite RCRA landfill; and excavation with offsite thermal destruction of remaining sludges. Second O.U. will address GW remediation	Chemical-specific cleanup levels not provided	$37,453,050 (capital) $15,000 (annual O&M)
VI	Sikes Disposal Pits, TX	09/18/86	1st-Final	GW, soil, and SW contaminated with VOCs and organics	150,000 yd^3	Excavation and onsite incineration of sludges and soils with onsite disposal of residual ash; banning usage of onsite upper aquifer during natural attenuation; and SW treatment, as necessary, with discharge to river	Soil and sludges will be excavated to VOCs 10 mg/kg. The upper aquifer will be attenuated to 10^{-5} Human Health Criteria	$102,217,000 (capital) $41,000 (annual O&M)

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Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	South Valley, NM	03/22/85	IRM	GW contaminated with organics	Not provided	Installation of a new water supply well	New water supply will meet the 10^{-6} cancer risk level by attaining 1,1-dichloroethane 0.25 ug/l, trichloroethene 2.8 ug/l, and tetrachloroethene 0.9 ug/l	$775,000 (capital) $12,000 (annual O&M)
VI	Tar Creek, OK	06/06/84	1st-Final	GW, SW, and sediments contaminated with acidic waste water, metals, and organics	Not provided	Diversion and diking at two major inflow areas; and plugging of 66 wells	Not provided	$400,000 (capital) $5,000 (annual O&M)
VI	Triangle Chemical, TX	06/11/85	1st-Final	Soil contaminated with VOCs	Not provided	Incineration and deep well injection of the tank and drum contents; mechanical aeration of contaminated soils; decontamination of all onsite structures; and offsite disposal of trash and debris	Soil will be aerated to background levels	$385,000 (capital) $500 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VI	United Creosoting Site, TX	09/30/86	1st	Soils contaminated with VOCs, organics including PCP and PAHs, and inorganics including creosote	84,000 yd^3	Demolition and purchasing of 6 homes with provision for permanent relocation of residents; onsite consolidation of surface soil with temporary capping; excavation and disposal of PAH contaminated soils at appropriate facility or treatment, if available; backfilling and covering; and natural GW attenuation	Excavation and disposal of all soils contaminated above PAH 100 mg/kg	Capital (undeveloped) $43,000 (interim closure period) (annual O&M)
VII	Aidex, IA	08/24/83	IRM	GW and soil contaminated with VOCs and pesticides	Not provided	Offsite disposal of bulk liquids and semi-solids by deep well injection; and onsite drainage control	Not provided	$3,580,175 (present worth) O&M (not provided)
VII	Aidex, IA	09/30/84	2nd-Final	GW and soil contaminated with VOCs and pesticides	Not provided	Excavation and offsite disposal of buried wastes and contaminated soil; backfilling, grading, and seeding of the site; expansion of the monitoring well network and biannual GW testing; and vacuuming and washing interior surfaces, floors, and walls of the onsite building	Not provided	$3,455,175 (capital) $875,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VII	Conservation Chemical, MO	09/30/87	1st-Final	Soil and GW contaminated with VOCs, organics, pesticides, metals, and inorganics	Not provided	Capping; GW pump and treatment; and decontamination and destruction of onsite structures	Cleanup goals are based on 10^{-6} health-based risk level targets. MCL levels to be attained include arsenic 50.0 ug/l, cadmium 10.0 ug/l, total chromium 50.0 ug/l, lead 50.0 ug/l, TCE 5.0 ug/l, benzene 5.0 ug/l, vinyl chloride 2.0 ug/l, and chloroform 0.19 ug/l. AWQC cleanup levels to be met include nickel 13.9 ug/l and zinc 5,000.0 ug/l	$8,626,000 (capital) $12,774,111 (present worth O&M)
VII	Des Moines TCE, IA	07/21/86	1st	GW contaminated with VOCs including TCE, and organics	Not provided	GW pump and treatment with discharge to SW	Extraction and treatment will continue until maximum TCE concentration in monitoring wells is 5 ug/l or less, for 4 consecutive months	$1,196,000 (capital) $63,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VII	Ellisville, MO	07/10/85	1st	Soil and SW contaminated with VOCs, organics, and pesticides	Not provided	Callahan Property: stabilization and erosion control; removal and disposal of plastic cover and cover's hold-down blocks; removal and salvaging of the barbed-wire and chain link fences; and gravel removal	Not provided	$12,000 (capital) O&M (not provided)
						Rosalie Property: excavation and offsite disposal of contaminated soil, drums, cans, and other debris; and soil testing and analysis	Not provided	$52,000 (capital) O&M (not provided)
VII	Ellisville, MO	09/29/86	2nd	Soil contaminated with VOCs, dioxins, and metals	Not provided	Excavation and onsite interim storage of dioxin contaminated soil; and excavation, transportation, and offsite land disposal of soils containing nondioxin waste	Not provided	$20,200,000 (present worth) O&M (not provided)
VII	Minker Stout/ Romaine Creek, MO	09/28/87	2nd	Soil and sediments contaminated with pesticides including TCDD	4,400 yd^3	Excavation and temporary storage of soil and sediments in an onsite RCRA facility; and backfilling of excavated areas with clean soil	Soil and sediments will be excavated to below TCDD 1.0 mg/kg. Excavation will not continue beyond a depth of 4 feet or once bedrock is reached	$4,488,000 (present worth) $28,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VII	Minker Stout/ Stout, MO	09/28/87	3rd	Soil contaminated with pesticides including TCDD	3,500 - 5,700 yd^3	Excavation and temporatory storage of soil in an onsite RCRA facility; backfilling of excavated areas with clean soil; and institutional controls to include site assess restrictions	Soil will be excavated to below TCDD 1.0 mg/kg. Excavation will not continue beyond a depth of 4 feet or once bedrock is reached	$5,817,000-7,018,000 (present worth) $6,000 (annual O&M)
VII	Times Beach, MO (Interim Storage Facility)	01/13/84	1st	Soil contaminated with dioxin	Not provided	Transportation of highly contaminated soil from other sites for storage in an onsite interim storage facility (to be constructed); and restoration of other sites by excavation and temporary relocation of affected residents	Not provided	$15,734,000 (capital) O&M (not provided)
VIII	Central City/ Clear Creek, CO	09/30/87	1st	Possible contamination of sediments, and downstream SW and GW with inorganics	Not provided	Passive/active treatment system for acid mine drainage discharge	Interim remedy. ARARs will be determined in future O.U.	$1,663,000 (capital) $511,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VIII	Denver Radium I (12th & Quivas), CO	09/29/87	4th	Soil contaminated with radium and its decay products	11,000 yd^3	Placement of cap over open 7,600 yd^3 of soil contamination; excavation of contaminated soil under several structures with temporary onsite storage (3,400 yd^3); maintenance of cap and storage area until a facility for permanent disposal becomes available; and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$3,702,800 (capital) $290,000 (present worth O&M)
VIII	Denver Radium II (11th & Umatilla), CO	09/29/87	5th	Soil and debris contaminated with radium and its decay products	15,400 yd^3	Excavation of contaminated soil with temporary onsite storage; decontamination of 11 ft^2 of roof and placement in onsite storage facility; maintenance of existing cap and onsite land storage facility until a facility for permanent disposal becomes available (15,400 yd^3); and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$4,230,300 (capital) $194,700 (present worth O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VIII	Denver Radium III (1,000 West Louisiana), CO	09/30/87	6th	Soil and debris contaminated with radium and its decay products	Not provided	Onsite temporary containment of contaminated material followed by offsite permanent disposal when available; cleanup of the Creative Illumination property; and dismantling of temporary storage facility with offsite disposal; and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level averaged more than 5 pCi/g, over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$2,172,800 (capital) $305,800 (present worth O&M)
VIII	Denver Radium/ Card Property, CO	06/30/87	3rd	Soil, sediment, and debris contaminated with radium and its decay products	4,000 yd^3	Excavation of 4,000 yd^3 soil and sediment with temporary onsite storage and final offsite disposal; and decontamination and dismantling of buildings with offsite disposal	Radium-226 in land average over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$1,148,000 (capital) $89,500 (present worth O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VIII	Denver Radium/ Open Space Property, CO	09/29/87	7th	Soil contaminated with radium and its decay products	1,310 yd^3	Onsite temporary containment of 290 yd^3 material followed by offsite permanent disposal; removal of 1,020 yd^3 of material with placement in containers followed by offsite disposal when available; and dismantling of temporary storage facility with offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed backgroung level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20uR/hr	$955,400 (present worth)
VIII	Denver Radium/ ROBCO, CO	09/30/86	2nd	Soil and buildings contaminated with radium	7,000 yd^3 (soil) 200 yd^3 (demolished buildings)	Excavation and offsite disposal of contaminated soils and debris; or Excavation, stabilization and temporary onsite consolidation of contaminated soils	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	$1,912,400 (capital) $6,000 (annual O&M)
VIII	Denver Radium Site Streets, CO	03/24/86	1st	Asphalt contaminated with radium	38,500 yd^3	Temporary leaving of contaminated material in place; institutional controls; and routine maintenance	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	$30,000 (capital) Annual O&M (variable)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VIII	Libby Ground Water, MT	09/26/86	1st	Soil and GW contaminated with organics including creosote, and inorganics	Not provided	Alternate water supply; and institutional controls prohibiting well usage	Not provided	PRP responsibility
VIII	Marshall Landfill, CO	09/26/86	1st-Final	GW and SW contaminated with VOCs including TCE and PCE, organics, and metals	Not provided	Installation of a subsurface collection system; GW treatment using sedimentation, air stripping, and off-gas carbon adsorption; regrading and revegetating; and fencing	Contaminated water will be treated to achieve removal of benzene 0, TCE 0, cadmium 0.6 mg/l, and lead 4 mg/l	$1,819,000 (capital) $152,000 (annual O&M)
VIII	Milltown, MT	04/14/84	1st	GW and soil contaminated with metals including arsenic	Not provided	Construction of a new well and distribution system; and flushing and testing residential plumbing systems	GW will be treated to EPA drinking water standards for arsenic 0.050 mg/l	$262,714 (capital) $4,238 (annual O&M)
VIII	Milltown, MT	08/07/85	2nd	GW and soil contaminated with metals including arsenic	Not provided	Replacement of household water supply appurtenances; and on-going testing of residential plumbing systems	Not provided	Not provided
VIII	North Dakota Arsenic Trioxide, ND	09/26/86	1st-Final	GW contaminated with metals including arsenic	Not provided	Expansion and hook-up of homes to GW treatment and distribution system; and evaluation of possible institutional controls	Water supplied for domestic and agricultural purposes will attain the MCL for arsenic 25 ug/l	$2,212,600 (capital) $57,400 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VIII	Rocky Mountain Arsenal, CO	06/04/87	1st	GW contaminated with VOCs including TCE, and inorganics	Not provided	Construction of granular activated carbon (GAC) water treatment system and regeneration of spent carbon at another location; modification of GAC system, if necessary, to include air stripping facility to treat vinyl chloride; replacement of existing well pumps and motors; installation of transmission piping; and construction of laboratory and office space	Treatment will attain the MCLs which include 1,1-dichloroethylene 0.007 mg/l, TCE 0.005 mg/l, PCE 0.005 mg/l, TCA 0.200 mg/l, trans-1,2 - dichloroethylene 0.005 mg/l, and vinyl chloride 0.001 mg/l	$8,869,000 or $10,100,000 (with air stripping) (capital) $372,000 (annual O&M)
VIII	Smuggler Mountain, CO	09/26/86	1st	GW and soil contaminated with metals including cadmium and lead	410,000 yd^3	Excavation and permanent onsite RCRA disposal of soils; soil capping; and alternate water supply	Excavation and onsite isolation of soil with lead greater than 5,000 mg/kg. Soils between 1,000-5,000 mg/kg will be covered with 6-12 inches of topsoil. GW will be monitored to comply with SDWA Standards	$1,816,550 (capital) $30,900 (annual O&M)
VIII	Union Pacific Railroad, WY	09/26/86	1st	GW and soil contaminated with organics including PCBs and creosote, and inorganics	Greater than 700,000 yd^3	Rechanneling of river; GW pump and treatment with carbon adsorption with discharge to river; and slurry wall barrier construction	Not provided	$7,000,000 (capital) $57,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
VIII	Woodbury Chemical, CO	07/19/86	1st	GW, soil, and sediments contaminated with pesticides, metals, and organics	Not provided	Excavaton, offsite transportation, and incineration of highly contaminated rubble and soil with disposal of residual ash; and backfilling with clean soil, regrading, and revegetation.	Contaminated soils will be treated to 3 mg/kg and contaminated rubble to total pesticides 100 mg/kg	$2,450,000 (capital) $21,000 (annual O&M)
IX	Celtor Chemical, Works, CA	10/04/83	IRM	GW, SW, and soil contaminated with metals and mining waste	Not provided	Offsite transportation and disposal of tailing piles and contaminated soil; and conduct of RI/FS	Not provided	$340,000 (capital) O&M (not provided)
IX	Celtor Chemical, CA	09/30/85	2nd-Final	SW and soil contaminated with metals including cadmium and arsenic	Not provided	Excavation and RCRA offsite disposal of contaminated soils	Action levels for soil will be based on National Water Quality Criteria. SW and GW will be based on MCLs or DWRs. River criteria will be based on standards for the protection of aquatic life	$3,065,338 (capital) $7,000 (annual O&M)
IX	Del Norte, CA	09/30/85	1st-Final	GW and soil contaminated with VOCs, pesticides, and metals including chromium	700 yd^3	Excavation and removal of soil; GW treatment with discharge to POTW; and disposal of chromium-rich waste brine to RCRA facility	Cleanup levels will meet the 10^{-6} cancer risk level and MCLs under SDWA	$1,240,000 (capital) $0 (O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IX	Iron Mountain, CA	10/03/86	1st	SW runoff from mountain contaminated with acid mine drainage consisting of sulfuric acid and metals; fish and sediment are also affected	2.5 acres (to be capped)	Capping of selected cracked and caved ground areas; and dam enlargement	Cleanup program will be designed to meet EPA Water Quality Criteria for Protection of Aquatic Life for the "worst case" condition of 1978	$68,100,000 (fund-balanced cost) (capital) $4,100,000 (present worth O&M)
IX	Jibboom Junkyard, CA	05/09/85	1st-Final	Soil contaminated with VOCs, metals including lead, zinc, and copper, and organics including PCBs	Not provided	Excavation and offsite disposal of contaminated soils	Soils containing lead above 500 mg/kg will be excavated	$1,460,000 (capital) O&M (not provided)
IX	Litchfield Airport, AZ	09/29/87	1st	GW contaminated with VOCs including TCE, and inorganics	Not provided	GW pump and treatment using air stripping and granular activated carbon with reinjection into aquifer	GW treatment will meet MCLs which include 1,1-dichloroethylene 7.0 ug/l, carbon tetrachloride 5.0 ug/l, chromium 50.0 ug/l, and arsenic 50.0 ug/l. Chloroform will meet the WQC of 5.0 ug/l	$2,358,500 (capital) $800,200 (annual O&M)

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FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IX	McColl Site, CA	04/11/84	1st	Soil contaminated with VOCs and inorganics including sulfur dioxide, hydrogen sulfide, and arsenic	Not provided	Excavation and offsite disposal of wastes and soil	Not provided	$21,500,000 (capital) $0 (O&M)
IX	Mountain View/ Globe, AZ	06/02/83	1st-Final	Soil contaminated with asbestos	Not provided	Permanent relocation of residents; onsite burial of containerized mobile homes; and fencing	Not provided	$4,432,000 (capital) $0 (O&M)
IX	Operating Industries, CA	07/31/87	1st	Leachate contaminated with VOCs including TCE	Not provided	Site control (operation and maintenance of existing systems) to include gas well probes and leachate pumping and collection	Interim Remedy. ARARs will be determined in future O.U.	$5,100,000 (present worth)
IX	San Fernando Valley, CA	09/24/87	1st	Area-wide GW contaminated with VOCs including TCE and PCE	Not provided	GW pump and treatment using aeration and granular activated carbon-air filtering units with discharge to pumping station for chlorination and distribution; and disposal or regeneration of spent carbon	GW treatment will meet the MCL for TCE 5.0 ug/l and the State Action level for PCE 4.0 ug/l	$2,192,895 (capital) $2,284,105 (present worth O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IX	San Gabriel/ Area I, CA	05/11/84	IRM	GW contaminated with VOCs including TCE and PCE	Not provided	GW pump and treatment using air stripping; and conduct of RI/FS	Not provided	$525,000 (capital) $38,000 (annual O&M)
IX	San Gabriel, CA	09/30/87	1st	GW contaminated with VOCs including PCE	Not provided	Well discharge treatment using activated carbon adsorption; and alternate water supply	Cleanup goals will reduce PCE below the detection limit of 1.0 ug/l for purgable halocarbons	$1,616,000-$1,771,800 (capital) $181,400-$303,100 (annual O&M)
IX	Stringfellow Acid Pits, CA	07/22/83	IRM	GW, SW, and soil contaminated with metals and organics	Not provided	Fencing; cap maintenance; and offsite leachate disposal	Not provided	$2,406,000 (present worth) O&M (not provided)
IX	Stringfellow Acid Pits, CA	07/17/84	1st	GW contaminated with pesticides, metals, and organics	Not provided	GW pump and treatment with offsite discharge to POTW	Not provided	$9,189,000 (capital) $1,724,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
IX	Stringfellow Acid Pits, CA	06/25/87	2nd	GW contaminated with VOCs including TCE, organics, inorganics, and metals	Not provided	GW pump and treatment with possible discharge to POTW; and SW diversion/collection with discharge to creek	GW treatment will meet SAWPA limitations for discharge of arsenic 2.0 mg/l, cadmium 0.064 mg/l, chromium 2.0 mg/l, lead 0.58 mg/l, total toxic organics (excluding PCBs and pesticides) 0.58 mg/l, and PCBs and pesticides 0.02 mg/l	$1,047,000-$1,136,000 (capital) $1,243,000-$1,408,000 (annual O&M)
IX	Taputimu Farm/Insular Territories, AS	12/27/83	1st-Final	Air contaminated with VOCs, and organics including PCBs and pesticides	Not provided	Repacking of chemical/pesticide materials stored onsite; decontamination and sealing of onsite storage facilities; and transportation of all waste materials to mainland for offsite disposal	Not provided	$0
X	Colbert Landfill, WA	09/29/87	1st-Final	GW contaminated with VOCs, including TCE and PCE	Not provided	Installation and operation of interception and extraction wells with onsite GW treatment; and provision of an alternate water supply	Cleanup goals based on MCLS include TCA 200.0 mg/l, DCE 7.0 ug/l, TCE 5.0 ug/l, and DCA 4,050.0 ug/l. Methylene chloride 2.5 ug/l and PCE 0.7 ug/l are based on the 10^{-6} cancer risk level	$24,000,000 (present worth)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
X	Ponders Corner, WA	06/01/84	IRM	GW contaminated with VOCs and organics	Not provided	GW treatment using air stripping; and conduction of RI/FS	Not provided	$1,163,000 (capital) $82,000 (annual O&M)
X	Ponders Corners, WA	09/30/85	2nd	GW and soil contaminated with VOCs including TCE and PCE	Not provided	Continued operation of H1-H2 treatment system; installation of variable-frequency controllers on well pump motors to reduce energy requirements; changing of fan drives on treatment tower; installation of new monitoriong wells, upgrading of existing wells, and continued sampling and analysis of aquifer; excavation and offsite disposal of septic tanks and drain field piping; and placement of administrative restrictions on excavation of soil and installation and usage of wells	The remedy will meet the recommended occupational air levels for VOCs which are based on OSHA Standards	$334,970 (capital) $82,000 (annual O&M)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
X	Queen City Farms, WA	10/24/85	1st	SW, soil, and sediments contaminated with VOCs including TCE, organics including PCBs, and metals including chromium and lead	22,000 yd^3	Excavation, stabilization, and offsite disposal of sludges, sediments, and soils; and capping	Not provided	$3,439,000 (capital) O&M (PRP responsibility)
X	South Tacoma Channel Well 12A, WA	03/18/83	IRM	GW contaminated with VOCs including TCE	Not provided	GW pump and treatment using air stripping	Not provided	$1,200,000 (capital) $60,000 (annual O&M)
X	South Tacoma Channel Well 12A, WA	05/03/85	2nd	GW and soil contaminated with VOCs including TCE and PCE	Not provided	Continue operation of IRM; construction of a GW treatment system; excavation and offsite disposal of contaminated soil with soil flushing; and maintenance of institutional controls	Specific GW cleanup goals have not been established. Attainment of the 10^{-6} risk range has been recommended	$1,590,000 (capital) $50,000 (annual O&M)
X	Toftdahl Drums, WA	09/30/86	1st-Final	None	Not provided	No further action with GW monitoring	Not provided	$0

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
X	United Chrome, OR	09/12/86	1st-Final	GW and soil contaminated with metals including chromium	350 tons (offsite disposal)	Excavation and offsite disposal of soils; flushing of soils above shallow GW table; and GW pump and treatment using chemical reduction and precipitation with discharge to POTW or SW	The chromium cleanup criteria for the confined aquifer is 0.05 mg/l and 10 mg/l for the unconfined zone. A treatment effluent concentration of 0.3 to 0.4 mg/l chromium is expected to be maintained	$1,580,000 (capital) $261,000 (annual O&M)
X	Western Processing, WA	08/05/84	1st	GW and soil contaminated with VOCs including TCE, inorganics including cyanide, pesticides, and metals including arsenic and cadmium	Not provided	Removal and offsite disposal/incineration of all bulk liquids, drummed liquids, waste piles, and other debris; removal and proper disposal of all transformers and substation equipment; demolition and offsite disposal of all onsite buildings; dismantling of all onsite bulk storage tanks; controlling and treatment of stormwater; and onsite and perimeter monitoring of air quality	Not provided	$5,000,000 (capital) O&M (not provided)

FY82-FY87 Record of Decision Summary Table

Region	Site Name, State	Signature Date	Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/ O&M Costs
X	Western Processing, WA	09/25/85	2nd	GW, SW, soil, and creek sediments contaminated with VOCs, organics including PCBs and PAHs, and metals	Not provided	Soil sampling and analysis of onsite and offsite areas; excavation and offsite disposal of selected soils and non-soil materials; excavation or cleaning and plugging all utility and process lines in Area I; GW extraction and treatment; stormwater control; excavation and onsite disposal of selected soils; excavation of utility lines; cleaning utility manholes and vaults; capping; performing bench scale testing of soil solidification technique; and excavation of Mill Creek sediments; and performing supplemental remedial planning studies if GW contamination migrates	All soils contaminated with PCBs over 2 mg/kg and hot spots exceeding 10^{-5} risk level will be excavated. Aquatic organisms will be protected through MCL or ACL goals	$18,100,000 (capital) $2,000,000 (annual O&M)

SECTION V

RECORDS OF DECISION

KEY WORD LIST: FY 1982 - 1988

The ROD Key Word List presents the RODs approved from FY 1982 - 1988 by major key word categories and subcategories. The key words are a compilation of those identified for each site in the ROD abstracts found at the beginning of this document. The first two pages of this list provide an index of all key words and subcategories. The following text lists those RODs associated with each key word.

RECORD OF DECISION KEY WORD LIST INDEX

Listed below are major key word categories and their subcategories for Superfund Records of Decision (RODs).

Primary Hazardous Substances Detected

- Acids
- Arsenic
- Asbestos
- Benzene
- Carcinogenic Compounds
- Chromium
- Dioxin
- Inorganics
- Lead
- Metals
- Mining Wastes
- Oils
- Organics/VOCs
- PAHs
- PCBs
- PCE
- Pesticides
- Phenols
- Radioactive Materials
- Sludge
- Solvents
- Synfuels
- TCE
- Toluene

Contaminated Media

- Air
- Debris
- Ground Water
- Sediments (Creek/River/Stream)
- Sludge
- Soil
- Surface Water

Public Health and Environmental Threats

- Direct Contact
- Public Exposure

Remedy Selection

- Consent Decree
- Deed Restriction
- Fund Balancing
- Interim Remedy
- No Action Remedy
- O&M
- ROD Addendum

Water Supply

- Alternate Water Supply
- Drinking Water Contaminants

Site Specific Characteristics

- Flood Plain
- Seismic
- Sole-Source Aquifer
- Subsidence

Standard/Regulations Permits/Guidance

- ARARs
  - MCLs
  - MCLGs
- Clean Air Act
- Clean Water Act
- Drinking Water Standards
- Institutional Controls
- Public Health Advisory
- RCRA
- RCRA Closure Requirements
  - Alternate Closure
  - Clean Closure
  - Landfill Closure

RECORD OF DECISION KEY WORD LIST INDEX
(continued)

Standard/Regulations Permits/Guidance
(Continued)

RCRA Landfill Specifications
RCRA Locational Requirements
Safe Drinking Water Act
State Criteria/Guidance/Advisories
State Permit
Toxic Substances Control Act
Water Quality Criteria

Testing/Pilot Studies

Leachability Tests
Treatability Studies

Technology

Aeration
Air Monitoring
Air Stripping
Capping
Containment
Decontamination
Dredging
Excavation
Filling
Granular Activated Carbon
Ground Water Monitoring
Ground Water Treatment
Incineration
Land Treatment
Leachate Collection/Treatment

Technology
(Continued)

Levees
Offsite Discharge
Offsite Disposal
Offsite Treatment
Onsite Containment
Onsite Discharge
Onsite Disposal
Onsite Treatment
Plume Management
Publicly Owned Treatment Works (POTW)
Relocation
Slurry Wall
Soil Washing/Flushing
Solidification/Stabilization
Surface Water Diversion/Collection
Surface Water Monitoring
Temporary Storage
Treatment Technology
Vacuum Extraction
Venting

Miscellaneous

Municipally-Owned Site
Wetlands
Woodlands

Historically Significant

ACL
Background Levels
Deferred Decision
Temporary Remedial Measure

SUPERFUND RECORDS OF DECISION:
KEY WORD LIST

Listed below are major key word categories and their subcategories for Superfund Records of Decision (RODs). Opposite each of these categories is a broad sampling of sites whose ROD contains the listed key word. Some categories may become obsolete or new categories may develop over time due to changes in the focus of the Superfund remedy selection process. The Superfund managers in each Region have copies of all RODs.

KEY WORDS (By Category)	**ASSOCIATED ROD SITES**
Primary Hazardous Substances Detected	**Site, State (Region)**
Acids	Charles George, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Nyanza Chemical, MA (I); Western Sand & Gravel, RI (I); Yaworski Lagoon, CT (I); Chemical Control, NJ (II); PAS Oswego, NY (II); Bruin Lagoon, PA (III); Douglassville, PA (III); Fike Chemical, WV (III); Lackawanna Refuse Site, PA (III); Southern Maryland Wood, MD (III); A&F Materials-IRM, IL (V); Chem-Dyne-EDD, OH (V); Forest Waste, MI (V)*; Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Highlands Acid Pit, TX (VI); Tar Creek, OK (VI); Arkansas City Dump, KS (VII); Conservation Chemical, MO (VII); Fulbright/Sac River Landfill, MO (VII); Celtor Chemical Works, CA (IX); Iron Mountain Mines, CA (IX); Stringfellow Acid Pits, CA (IX)*; Gould, OR (X); Queen City Farms-IRM/EDD WA (X); Western Processing, WA (X)
Arsenic	Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Montgomery Township Housing, NJ (II)*; Sinclair Refinery, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Volney Landfill, NY (II); Ringwood Mines/Landfill, NY (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Chisman Creek, VA (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III)*; Douglassville, PA (III); Henderson Road, PA (III); McAdoo-IRM, PA (III); Moyer

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Arsenic (continued)	Landfill, PA (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Rhinehart Tire Fire, VA (III);Wildcat Landfill, DE (III); American Creosote, FL (IV); Davie Landfill, FL (IV); Geiger (C&M Oil), SC (IV); National Starch, NC (IV); Newport Dump, KY (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Arcanum Iron & Metal, OH (V); Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); Morris Arsenic, MN (V); New Brighton (TCAAP), MN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Atchison/Santa Fe (Clovis), NM (VI); Crystal City Airport, TX (VI); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); South Calvacade Street, TX (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Anaconda Smelter/Mill Creek, MT (VIII); Arsenic Trioxide, ND (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Lorentz Barrel & Drum, CA (IX); Milltown, MT (VIII); Celtor Chemical, CA (IX)*; Litchfield Airport, AZ (IX); McColl, CA (IX); Selma Pressure Treating, CA (IX); Martin Marietta, OR (X); Western Processing, WA (X)
Asbestos	Asbestos Dump, NJ (II); Ambler Asbestos Piles, PA (III); Fike Chemical, WV (III); West Virginia Ordnance, WV (III); Johns-Manville, IL (V); New Lyme, OH (V); Broderick Wood Products, CO (VIII); Mountain View/Globe, AZ (IX); South Bay Asbestos, CA (IX); Martin Marietta, OR (X)
Benzene	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Keefe Environmental Services, NH (I)*; Landfill & Resource Recovery, RI (I); Old Springfield Landfill, VT (I); Rose Disposal Pit, MA (I); Ewan Property, NJ (II); Haviland Complex, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Vega Alta, PR (II); Volney Landfill, NY (II); York Oil, NY (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Benzene (continued)	Chemical, PA (III)*; Henderson Road, PA (III); Kane and Lombard, MD (III); L.A. Clarke & Son, VA (III); Southern Maryland Wood, MD (III); Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Goodrich, B.F.,KY (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Wamchem, SC (IV); Allied/Ironton Coke, OH (V)*; Fort Wayne Reduction, IN (V); Kummer Sanitary Landfill, MN (V)*; Mason County Landfill, MI (V); Mid-State Disposal, WI (V); Liquid Disposal, MI (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Bailey Waste Disposal, TX (VI); Highlands Acid Pits, TX (VI)*; Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); South Calvacade Street, TX (VI); Deere, John, Dubuque Works, IA (VII); Broderick Wood Products, CO (VIII); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X)
Carcinogenic Compounds	Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I); Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I); Diamond Alkali, NJ (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Old Bethpage, NY (II); Upjohn Manufacturing, PR (II); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); Middletown Airfield, PA (III); Ordnance Works Disposal, WV (III); Taylor Borough, PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Airco, KY (IV); Brown Wood Preserving, FL (IV); Chemtronics, NC (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); National Starch, NC (IV); Powersville Landfill, GA (IV); Wamchem, SC (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Forest Waste Disposal, MI (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; Northside Sanitary Landfill/

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Carcinogenic Compounds (continued)	Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Reilly Tar, MN (V); U.S. Aviex, MI (V); Bailey Waste Disposal, TX (VI); French Limited, TX (VI); Hardage/Criner, OK (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Central City/Clear Creek, CO (VIII)*; Rocky Mountain Arsenal, CO (VIII); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); South Bay Asbestos, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X)
Chromium	Hocomonco Pond, MA (I); Industri-plex, MA (I); Nyanza Chemical, MA (I); Yaworski Lagoon, CT (I); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Haviland Complex, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Lipari Landfill, NJ (II)*; Sinclair Refinery, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Waldick Aerospace, NJ (II); Aladdin Plating, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III)*; Douglassville, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); New Castle Steel DE (III); Voortman Farm, PA (III); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Davie Landfill, FL (IV); Geiger (C&M Oil), SC (IV); Independent Nail, SC (IV)*; National Starch, NC (IV); Newport Dump, KY (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Powersville Landfill, GA (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Burrows Sanitation, MI (V); Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); New Brighton (TCAAP), MN (V)*; Northernaire, MI (V); Novaco Industries, MI (V); Republic Steel Quarry, OH (V); Schmalz Dump, WI (V); Schmaltz Dump,

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Chromium (continued)	WI (V)*; South Andover, MN (V); Summit National, OH (V); Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Mid-South Wood, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Odessa Chromium I, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI); Odessa Chromium II, TX (VI)*; South Calvacade Street, TX (VI); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Del Norte, CA (IX); Litchfield Airport, AZ (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Queen City Farms-IRM/EDD, WA (X); United Chrome, OR (X); Western Processing, WA (X)*
Dioxin	Baird & McGuire, MA (I); Diamond Alkali, NJ (II); Hyde Park-EDD, NY (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Pristine, OH (V); Conservation Chemical, MO (VII); Ellisville MO (VII); Ellisville Site Area, MO (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Selma Pressure Treating, CA (IX)
Inorganics	Auburn Road, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Sylvester, NH (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); Old Bethpage, NY (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Chisman Creek, VA (III)*; Delaware Sand and Gravel, DE (III); Douglassville, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); McAdoo-IRM, PA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III); Rhinehart Tire Fire, VA (III); Voortman Farm, PA (III); Wade, PA (III); Airco, KY (IV);

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Primary Hazardous Substances Detected (continued)	Site, State (Region)
Inorganics (continued)	Chemtronics, NC (IV); Distler Brickyard, KY (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Independent Nail, SC (IV)*; Newport Dump, KY (IV); Pioneer Sand, FL (IV); SCRDI Dixiana, SC (IV); A. L. Taylor, KY (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Burrows Sanitation, MI (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Industrial Excess Landfill, OH (V); Johns-Manville, IL (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Reilly Tar, MN (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); South Andover, MN (V); Summit National, OH (V); Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Cecil Lindsey, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); MOTCO, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Tar Creek, OK (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Ellisville, MO (VII); Fulbright/Sac River Landfill, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Syntex Verona, MO (VII); Anaconda Smelter/Mill Creek, MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII); Iron Mountain Mine, CA (IX); Motorola 52nd Street, AZ (IX); Ordot Landfill, GU (IX); South Bay Asbestos, CA (IX); Stringfellow Acid Pits, CA (IX); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X)
Lead	Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Yaworski Lagoon, CT (I); Burnt Fly Bog, NJ (II)*; Ewan Property, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ringwood Mines/Landfill, NY (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; New Castle Steel DE (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*;

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Lead (continued)	Rhinehart Tire Fire, VA (III); Voortman Farm, PA (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Chemtronics, NC (IV); Flowood, MS (IV); Independent Nail, SC (IV)*; Powersville Landfill, GA (IV); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); Laskin/Poplar, OH (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Pristine, OH (V); Republic Steel Quarry, OH (V); South Andover, MN (V); United Scrap Lead, OH (V); Atchison/Santa Fe (Clovis), NM (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); South Calvacade Street, TX (VI); Cherokee County/Galena, KS (VII); Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Stringfellow Acid Pits, CA (IX); Commencement Bay/Nearshore, WA (X); Gould, OR (X)
Metals	Auburn Road, NH (I); Baird & McGuire, MA (I); Charles George Landfill 3 & 4, MA (I)*; Cannon/Plymouth, MA (I); Charles George, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Keefe Environmental, NH (I); Laurel Park, CT (I); Nyanza Chemical, MA (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I); Sylvester, NH (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Chemical Control, NJ (II)*; D'Imperio Property, NJ (II); Ewan Property, NJ (II); Florence Landfill, NJ (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Haviland Complex, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Marathon Battery, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NJ (II); Syncon Resins, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Chisman Creek, VA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Metals (continued)	Disposal, PA (III)*; Drake Chemical, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Kane & Lombard, MD (III); McAdoo-IRM, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Voortman Farm, PA (III); Wade, PA (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); A. L. Taylor, KY (IV); American Creosote, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Distler Brickyard, KY (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Independent Nail, SC (IV)*; Miami Drum Services, FL (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Byron/Johnson Salvage Yard, IL (V); Mid-State Disposal, WI (V); Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Marion/Bragg Landfill, IN (V); Coshocton Landfill, OH (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Schmalz Dump, WI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bio-Ecology Systems, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Johns-Manville, IL (VI); Odessa Chromium I, TX (VI); Old Inger, LA (VI); MOTCO, TX (VI); Sand Springs, OK (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Tar Creek, OK (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII);

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Metals (continued)	Conservation Chemical, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Iron Mountain Mine, CA (IX); Jibboom Junkyard, CA (IX); Lorentz Barrel & Drum, CA (IX); Motorola 52nd Street, AZ (IX); Ordot Landfill, GU (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Queen City Farms-IRM/EDD, WA (X); United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Mining Wastes	Tar Creek, OK (VI); United Nuclear, NM (VI); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Milltown, MT (VIII); Smuggler Mountain, CO (VIII); Celtor Chemical Works, CA (IX); Iron Mountain Mine, CA (IX)
Oils	Davis Liquid Waste, RI (I); Groveland Wells, MA (I); McKin, ME (I)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Douglassville Disposal, PA (III)*; Enterprise Avenue, PA (III); Rhinehart Tire Fire, VA (III); Airco, KY (IV); Coleman Evans, FL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); A&F Materials-IRM, IL (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Old Inger, LA (VI); Ellisville, MO (VII); Broderick Wood Products, CO (VIII); Union Pacific, WY (VIII); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Western Processing, WA (X)

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Organics/VOCs	Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon Engineering, MA (I); Charles George, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Industri-plex, MA (I); Keefe Environmental, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Old Springfield Landfill, VT (I); Ottati and Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Sylvester, NH (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Chemical Control, NJ (II)*; Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Florence Landfill,NJ (II); Friedman Property, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Suffern Village Well Field, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Army Creek Landfill, DE (III); Bendix, PA (III); Berks Sand Pit,

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Organics/VOCs (continued)	PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Industrial Lane, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); McAdoo-IRM, PA (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Wade, PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); A. L. Taylor, KY (IV); American Creosote, FL (IV); Biscayne Aquifer Sites, FL (IV); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); Perdido Groundwater, AL (IV); Pioneer Sand, FL (IV); Powerville Landfill, GA (IV); SCRDI Dixiana, SC (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Cemetery Dump, MI (V); Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Industrial Excess Landfill, OH (V); Kummer Landfill, MN (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton/

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Organics/VOCs (continued)	St. Anthony-IRM, MN (V); New Brighton/Arden Hills/ St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Brighton (TCAPP), MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill OH (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Rose Township, MI (V); Seymour, IN (V); Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); MOTCO, TX (VI); North Cavalcade Street, TX (VI); Old Inger, LA (VI); Petro-Chemical Systems, TX (VI); Sand Springs, OK (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley-IRM, NM (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Triangle Chemical, TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Broderick Wood Products, CO (VIII); Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Del Norte, CA (IX); Indian Bend Wash, AZ (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area I, CA

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Organics/VOCs (continued)	(IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Stringfellow Acid Pits, CA (IX)*; Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Ponders Corner-IRM, WA (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X); Western Processing, WA (X)*
PAHs (Polynuclear Aromatic Hydrocarbons)	Baird & McGuire, MA (I); Cannon Engineering, MA (I) Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Iron Horse Park, MA (I); Old Springfield Landfill, VT (I); Caldwell Trucking, NJ (II); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Renora Inc., NJ (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Kane & Lombard, MD (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Taylor Borough, PA (III); Westline Site, PA (III); Airco, KY (IV); A. L. Taylor, KY (IV); American Creosote, FL (IV); Brown Wood Preserving, FL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); SCRDI Dixiana, SC (IV); Sodyeco, NC (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Coshocton Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Laskin/Poplar Oil, OH (V)*; Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Summit National, OH (V); Velsicol Chemical, IL (V); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; French Limited, TX (VI); Geneva Industries, TX (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); North Cavalcade Street, TX (VI); Old Midland Products, AR (VI); Petro-Chemical Systems, TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI); Arkansas City Dump, KS (VII); Broderick Wood Products, CO (VIII); Libby Ground Water, MT (VIII); Commencement Bay/Nearshore, WA (X); Martin Marietta, OR (X); Western Processing, WA (X)*

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
PCBs (Polychlorinated Biphenyls)	Cannon Engineering, MA (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); GE Moreau, NY (II); Goose Farm, NJ (II); Hudson River, NY (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Ludlow Sand & Gravel, NY (II); Pijak Farm, NJ (II); Renora Inc., NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Wide Beach, NY (II); York Oil, NY (II); Delaware Sand and Gravel, DE (III); Douglassville, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Harvey-Knott, DE (III); Kane & Lombard, MD (III); Lehigh Electric, PA (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Wildcat Landfill, DE (III); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); SCRDI Dixiana, SC (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Biphenyls) Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Ninth Avenue Dump, IN (V); Liquid Disposal, MI (V); Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Rose Township, MI (V); Schmalz Dump, WI (V); Summit National, OH (V); Bio-Ecology Systems, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR, (VI); MOTCO, TX (VI); Sol Lynn (03/25/88), TX (VI); Jibboom Junkyard, CA (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Taputimu Farm, AS (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*
PCE (Tetrachloroethylene/ Perchloroethylene)	Keefe Environmental, NH (I); Old Springfield Landfill, VT (I); Picillo Farm, RI (I); Rose Disposal Pit, MA (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II);

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
PCE (Tetrachloroethylene/ Perchloroethylene) (continued)	Combe Fill South Landfill, NJ (II); Ewan Property, NJ (II); Katonah Municipal Well, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Vega Alta, PR (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Berks Sand Pit, PA (III); Fischer & Porter, PA (III); Henderson Road, PA (III); Middletown Airfield, PA (III); Tyson's Dump (Amendment), PA (III); A. L. Taylor, KY (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); SCRDI Dixiana, SC (IV); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Kummer Sanitary Landfill, MN (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; Verona Well Field-IRM, MI (V); Pristine, OH (V); South Andover, MN (V); U.S. Aviex, MI (V); Verona Well Field, MI (V)*; Geneva Industries, TX (VI); Hardage/Criner, OK (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Deere, John, Dubuque Works, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Indian Bend Wash, AZ (IX); Lorentz Barrel & Drum, CA (IX); Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Colbert Landfill, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*
Pesticides	Baird & McGuire, MA (I); Cannon/Plymouth MA (I); Davis Liquid Waste, RI (I); Ottati & Goss/Great Lakes, NH (I); Chemical Control, NJ (II); Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Krysowaty Farm, NJ (II); Lone Pine Landfill, NJ (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Pijak Farm, NJ (II); Renora, Inc., NJ (II); Syncon Resins, NJ (II); Douglassville, PA (III); Drake Chemical, PA (III); Leetown Pesticide, WV (III); Gallaway Ponds, TN (IV); Miami Drum Services, FL (IV); Powersville Landfill, GA (IV); SCRDI Dixiana, SC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Chem-Dyne-EDD, OH (V); Forest Waste Disposal, MI

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Primary Hazardous Substances Detected (continued)	Site, State (Region)
Pesticides (continued)	(V)*; IMC Terre Haute, IN (V); Liquid Disposal, MI (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Velsicol Chemical, IL (V); Bayou Sorrel, LA (VI); Crystal City Airport, TX (VI); Hardage/Criner, OK (VI); Old Inger, LA (VI); Aidex-IRM, IA (VII); Ellisville, MO (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Woodbury Chemical, CO (VIII); Del Norte, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Western Processing, WA (X)
Phenols	Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Picillo Farm, RI (I); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Ludlow Sand & Gravel, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); York Oil, NY (II); Avtex Fibers, VA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Drake Chemical, PA (III)*; Millcreek, PA (III); Sand, Gravel & Stone, MD (III); Westline, PA (III); Celanese Fibers Operations, NC (IV); Coleman Evans, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Fort Wayne Reduction, IN (V); Laskin/Poplar Oil, OH (V); Reilly Tar & Chemical, MN (V)*; Summit National, OH (V); Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Geneva Industries, TX (VI); Koppers/Texarkana, TX (VI); Sikes Disposal Pits, TX (VI); Conservation Chemical, MO (VII); Conservation Chemical, MO (VII); Ellisville, MO (VII); Broderick Wood Products, CO (VIII); Selma Pressure Treating, CA (IX); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*
Radioactive Materials	Lansdowne Radiation, PA (III); Lansdowne Radiation, PA (III)*; Moyer Landfill, PA (III); United Nuclear, NM (VI); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium ROBCO, CO (VIII)*

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Solvents	Davis Liquid Waste, RI (I); Keefe Environmental, NH (I); McKin, ME (I)*; Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); Montgomery Township Housing, NJ (II)*; Spence Farm, NJ (II); Vestal, NY (II); Berks Sand Pit, PA (III); Enterprise Avenue, PA (III); Lackawanna Refuse Site, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Miami Drum Services, FL (IV); A&F Materials-IRM, IL (V); Berlin & Farro, MI (V); Charlevoix, MI (V); Coshocton Landfill, OH (V); Cross Bros., IL (V); New Brighton-Interim Water Treatment, MN (V)*; Forest Waste Disposal, MI (V)*; Mid-State Disposal, WI (V); New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Old Mill, OH (V); Summit National, OH (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); Old Inger, LA (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Ellisville, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Motorola 52nd Street, AZ (IX); Taputimu Farm, AS (IX); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); Western Processing, WA (X)
Synfuels	Western Processing, WA (X)
TCE (Trichloroethylene)	Auburn Road, NH (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Keefe Environmental, NH (I); Kellogg-Deering Well Field, CT (I); McKin-IRM, ME (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Lang Property, NJ (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II);

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TCE (Trichloroethylene) (continued)	Sharkey Landfill, NJ (II); Tabernacle Drum Dump, NJ (II); Vega Alta, PR (II); Vestal, NY (II); Waldick Aerospace, NJ (II); Bendix, PA (III); Blosenski Landfill, PA (III); Drake Chemical, PA (III)*; Fischer & Porter, PA (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Industrial Lane, PA (III); Kimberton, PA (III); Limestone Road, MD (III); Middletown Airfield, PA (III); Millcreek, PA (III); Tyson's Dump (Amendment), PA (III); Moyer Landfill, PA (III); Taylor Borough, PA (III); Airco, KY (IV); Distler Brickyard, KY (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); National Starch, NC (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Coshocton Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Kummer Sanitary Landfill, MN (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); New Brighton/St. Anthony-IRM, MN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton-Water Supply System, MN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Seymour, IN (V); South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Sol Lynn (09/23/88), TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/SJ-6, NM (VI)*; Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Marshall Landfill, CO (VII); Rocky Mountain Arsenal, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Gabriel/Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; San Fernando Area I, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)

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Primary Hazardous Substances Detected (continued)	**Site, State (Region)**
Toluene	Charles George, MA (I); Industri-plex, MA (I); Old Springfield Landfill, VT (I); Rose Disposal Pit, MA (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lipari Landfill, NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Sinclair Refinery, NY (II); Blosenski Landfill, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kane & Lombard, MD (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump Site, PA (III)*; A. L. Taylor, KY (IV); Airco, KY (IV); American Creosote, FL (IV); Chemtronics, NC (IV); Distler Brickyard, KY (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Wamchem, SC (IV); Zellwood, FL (IV); Coshocton Landfill, OH (V); FMC Corporation, MN (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Oak Grove Landfill, MN (V); Republic Steel Quarry, OH (V); Seymour, IN (V); South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Verona Well Field, MI (V)*; Bailey Waste Disposal, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Sikes Disposal Pits, TX (VI); South Calvacade Street, TX (VI); Triangle Chem., TX (VI); Big River Sand, KS (VII); Deere, John, Dubuque Works, IA (VII); Ellisville, MO (VII); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

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Contaminated Media

Air	Charles George Landfill 3 & 4, MA (I)*; Landfill & Resource Recovery, RI (I); McKin-IRM, ME (I); Sylvester, NH (I); Asbestos Dump, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Love Canal, NY (II); Lipari Landfill, NJ (II)*; Old Bethpage, NY (II); Heleva Landfill, PA (III); Lansdowne Radiation, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Taylor Borough, PA (III); Wade, PA (III); Berlin & Farro, MI (V); Chem-Dyne-EDD, OH (V); Johns-Manville, IL (V); Outboard Marine, IL (V); Verona Well Field-IRM, MI (V); Anaconda Smelter/Mill Creek, MT (VIII); Denver Radium II, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Mountain View/Globe, AZ (IX); Operating Industries (09/30/88), CA (IX)*; South Bay Asbestos, CA (IX); Taputimu Farm, AS (IX); South Tacoma, WA (X)
Debris	Cannon Engineering, MA (I); Iron Horse Park, MA (I); Old Springfield Landfill, VT (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Chemical Control, NJ (II)*; GE Wiring Devices, PR (II); Love Canal, NY (II)*; Marathon Battery, NY (II)*; Waldick Aerospace, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Kane & Lombard, MD (III); Southern Maryland Wood, MD (III); Wildcat Landfill, DE (III); Tower Chemical, FL (IV); LaSalle Electrical Utilities, IL (V)*; Liquid Disposal, MI (V); Pristine, OH (V); Summit National, OH (V); Waste Disposal Engineering, MN (V); Brio Refining, TX (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); Odessa Chromium I, TX (VI)*; Fulbright/Sac River Landfill, MO (VII); Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*;MGM Brakes, CA (IX); Frontier Hard Chrome (12/30/87), WA (X); Martin Marietta, OR (X)
Ground Water	Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I); Davis Liquid Waste, RI (I);

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Contaminated Media **(continued)**	**Site, State (Region)**
Ground Water (continued)	Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Laurel Park, CT (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Old Springfield Landfill, VT (I); Ottati & Goss/ Great Lakes, NH (I); Picillo Farm, RI (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Sylvester, NH (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Chemical Control, NJ (II)*; Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Florence Landfill, NJ (II); Friedman Property, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Price Landfill, NJ (II)*; Renora, Inc., NJ (II); Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Suffern Village Well Field, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Delaware Sand and Gravel, DE (III); Douglassville, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fischer & Porter, PA (III); Harvey-Knott, DE (III); Heleva Landfill,

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Contaminated Media (continued)	**Site, State (Region)**
Ground Water (continued)	PA (III); Henderson Road, PA (III); Industrial Lane, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump, PA (III)*; Wade, PA (III); Westline, PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); American Creosote, FL (IV); Biscayne Aquifer Sites, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Coleman Evans, FL (IV); Davie Landfill, FL (IV); Distler Brickyard, KY (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Independent Nail, SC (IV)*; Miami Drum Services, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); Powersville Landfill, GA (IV); SCRDI Dixiana, SC (IV); Sapp Battery, FL (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Varsol Spill Site, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); Industrial Excess Landfill, OH (V); Kummer Sanitary Landfill, MN (V)*; Lake Sandy Jo, IN (V); LaSalle Electrical Utilities, IL (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Well Field, IN (V); Marion/Bragg Landfill, IN (V); Mid-State Disposal, WI (V); New Brighton/St. Anthony-IRM, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Northernaire, MI (V); Northside Sanitary Landfill/

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Contaminated Media (continued)	Site, State (Region)
Ground Water (continued)	Environmental Conservation and Chemical Corporation, IN (V); Novaco Industries, MI (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); MOTCO, TX (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI); Odessa Chromium II, TX (VI)*; Old Inger, LA (VI); Old Midland Products, AR (VI); Sand Springs, OK (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley-IRM, NM (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tar Creek, OK (VI); United Creosoting, TX (VI); United Nuclear, NM (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Fulbright/Sac River Landfill, MO (VII); Arsenic Trioxide, ND (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Milltown-S, MT (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Celtor Chemical Works, CA (IX); Del Norte, CA (IX); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome

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Contaminated Media (continued)	Site, State (Region)
Ground Water (continued)	(07/05/88), WA (X)*; Martin Marietta, OR (X); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Sediments (Creek/River/ Stream)	Auburn Road, NH (I); Charles George Landfill 3 & 4, MA (I)*; Cannon/Plymouth, MA (I); Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Laurel Park, CT (I); Nyanza Chemical, MA (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Haviland Complex, NY (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Pijak Farm, NJ (II); Syncon Resins, NJ (II); Wide Beach, NY (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Berks Sand Pit, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Douglassville, PA (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Henderson Road, PA (III); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); Millcreek, PA (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); American Creosote, FL (IV); Brown Wood Preserving, FL (IV); Chemtronics, NC (IV); Coleman Evans, FL (IV); Flowood, MS (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Coshocton Landfill, OH (V); Fields Brook, OH (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); Lake Sandy Jo, IN (V); LaSalle Electrical Utilities, IL (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Outboard Marine Corp., IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V);

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Contaminated Media (continued)	**Site, State (Region)**
Sediments (Creek/River/ Stream (continued)	Schmalz Dump, WI (V); Seymour, IN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Sikes Disposal Pits, TX (VI); Old Midland Products, AR (VI); South Calvacade Street, TX (VI); Fulbright/Sac River Landfill, MO (VII); California Gulch, CO (VIII); Denver Radium/Card Property, CO (VIII)*; Milltown, MT (VIII); Woodbury Chemical, CO (VIII); Iron Mountain Mine, CA (IX); MGM Brakes, CA (IX); Gould, OR (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)
Sludge	Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Tinkham Garage, NH (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Bridgeport, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); Swope Oil, NJ (II); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III); Drake Chemical, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Laokawanna Refuse Site, PA (III); McAdoo Associates, PA (III)*; American Creosote, FL (IV); Brown Wood Preserving, FL (IV); Davie Landfill, FL (IV); Pioneer Sand, FL (IV); Zellwood, FL (IV); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Forest Waste IRM, MI (V); Forest Waste-IRM, MI (V)*; Laskin Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); Newlyme, OH (V); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Gurley Pitt-Edd, AK (VI); Highlands Acid Pit, TX (VI); Mid-South Wood, AK (VI); Motco, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Sikes Disposal Pitts, TX (VI); Arkansas City Dump, KS (VII); Des Moines TCE, IA (VII); Ellisville, MO (VII); Broderick Wood Products, CO (VIII); McColl, CA (IX); Queen City Farms-IRM/EDD, WA (X)

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Contaminated Media (continued)	**Site, State (Region)**
Soil	Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Industri-plex, MA (I); Keefe Environmental, NH (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Chemical Control, NJ (II)*; Combe Fill North Landfill, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; ; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Nascolite, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vestal, NY (II); Waldick Aerospace, NJ (II); Wide Beach, NY (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Bendix, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Enterprise Avenue, PA (III); Kane & Lombard, MD (III); Lackawanna Refuse Site, PA (III); L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA, (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA

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Contaminated Media (continued)	**Site, State (Region)**
Soil (continued)	(III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Wade, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); American Creosote, FL (IV); Brown Wood Preserving, FL (IV); Chemtronics, NC (IV); Coleman Evans, FL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Cross Bros., IL (V); Distler Brickyard, KY (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Kummer Sanitary Landfill, MN (V)*; Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mid-State Disposal, WI (V); Morris Arsenic, MN (V); New Lyme, OH (V); Northernaire, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX

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Contaminated Media (continued)	Site, State (Region)
Soil (continued)	(VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Crystal City, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); MOTCO, TX (VI); North Cavalcade Street, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Petro-Chemical Systems, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Triangle Chem., TX (VI); United Creosoting, TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Big River Sand, KS (VII); Conservation Chemical, MO (VII); Des Moines TCE, IA (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (V111)*; Denver Radium/ROBCO, CO (VIII)*; Libby Ground Water, MT (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte, CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Mountain View/Globe, AZ (IX); Motorola 52nd Street, AZ (IX); Selma Pressure Treating, CA (IX); South Bay Asbestos, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Surface Water	Auburn Road, NH (I); Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Ottati &

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Contaminated Media (continued)	Site, State (Region)
Surface Water (continued)	Goss/Great Lakes, NH (I); Re-Solve, MA (I); Rose Disposal Pit, MA (I); Sylvester, NH (I); Tinkham Garage, NH (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Marathon Battery, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bruin Lagoon, PA (III); Chisman Creek, VA (III); Chisman Creek, VA (III)*; Douglassville, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Fischer & Porter PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD Surface Water (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (VI); National Starch, NC (IV); Pioneer Sand, FL (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-EDD, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Johns-Manville, IL (V); Laskin/Poplar Oil, OH (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Summit National, OH (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Bio-Ecology Systems, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI)*; Mid-South Wood, AR (VI); MOTCO, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX

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Contaminated Media (continued)	**Site, State (Region)**
Surface Water (continued)	(VI); Tar Creek, OK (VI); Fulbright/Sac River Landfill, MO (VII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Smuggler Mountain, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Iron Mountain Mine, CA (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)*
Public Health and Environmental Threats	**Site, State (Region)**
Direct Contact	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I); Rose Disposal Pit, MA (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Diamond Alkali, NJ (II); GE Wiring Devices, PR (II); Hudson River, NY (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Montgomery Township, NJ (II); Nascolite, NJ (II); Pijak Farm, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Spence Farm, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Middletown Airfield, PA (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III)*; Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)* West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Flowood, MS (IV); Geiger

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Public Health and Environmental Threats (continued)	**Site, State (Region)**
Direct Contact (continued)	(C&M Oil), SC (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Powersville Landfill, GA (IV); Sodeyco, NC (IV); Wamchem, SC (IV); Zellwood, FL (IV); Belvidere Landfill, IL (V); Coshocton Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste-IRM, MI (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton (TCAAP); MN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; Cleve Reber, LA (VI); Crystal City Airport, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Petro-Chemical Systems, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Conservation Chemical, MO (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); San Fernando Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X);

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Public Health and Environmental Threats (continued)	**Site, State (Region)**
Direct Contact (continued)	Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X)
Public Exposure	Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Laurel Park, CT (I); Re-Solve, MA (I)*; Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Upjohn Manufacturing, PR (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Delaware Sand and Gravel, DE (III); Fike Chemical, WV (III); Henderson Road, PA (III); Lansdowne Radiation, PA (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Saltville Waste Disposal Ponds, VA (III); West Virginia Ordnance, WV (III)*; National Starch, NC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodeyco, NC (IV); Allied/Ironton Coke, OH (V)*; Eau Claire Municipal Well Field, WI (V)*; IMC Terre Haute, IN (V); Johns-Manville, IL (V); Industrial Excess Landfill, OH (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Rose Township, MI (V); Seymour, IN (V)*; Verona Well Field-IRM, MI (V); Crystal City Airport, TX (VI); South Valley/PL-83, NM (VI)*; Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Times Beach, MO (VII)*; California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII); Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Litchfield Airport, AZ (IX); McColl, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X)

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Remedy Selection

Consent Decree	Winthrop Landfill-EDD, ME (I); Hyde Park-EDD, NY (II); Upjohn Manufacturing, PR (II); Fischer & Porter, PA (III); Kimberton, PA (III); National Starch, NC (IV); A&F Materials Company-EDD, IL (V); Chem-Dyne-EDD, OH (V); NL/Taracorp/Golden Auto Parts, MN (V)*; Reilly Tar & Chemical, MN (V); Deere, John, Dubuque Works, IA (VII); Commencement Bay/Tacoma, WA (X)
Deed Restriction	Cannon Engineering, MA (I); Iron Horse Park, MA (I); Winthrop Landfill-EDD, ME (I); Friedman Property, NJ (II); Ludlow Sand & Gravel, NY (II); Avtex Fibers, VA (III); Chisman Creek, VA (III); Dorney Road Landfill, PA (III); Henderson Road, PA (III); West Virginia Ordnance Works, WV (III); Wildcat Landfill, DE (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Powersville Landfill, GA (IV); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Coshocton Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Lake Sandy Jo, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Morris Arsenic, MN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V); Seymour, IN (V)*; Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Brio Refining, TX (VI); Dixie Oil, TX (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); South Calvacade Street, TX (VI); Arkansas City Dump, KS (VII); Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); South Bay Asbestos, CA (IX); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
Fund Balancing	Outboard Marine Corp., IL (V); Iron Mountain Mine, CA (IX)
Interim Remedy	Burnt Fly Bog, NJ (II)*; Diamond Alkali, NJ (II); Upjohn Manufacturing, PR (II); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Kane & Lombard, MD (III); Kimberton, PA (III); Middletown Airfield, PA (III); Palmerton Zinc, PA (III); Saltville Waste Disposal Ponds, VA (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); New Brighton (TCAAP), MN (V)*; Cherokee

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Remedy Selection (continued)	**Site, State (Region)**
Interim Remedy (continued)	County/Galena, KS (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Litchfield Airport, AZ (IX); Operating Industries, CA (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); Stringfellow Acid Pits, CA (IX); Gould, OR (X)
No Action Remedy	Beachwood/Berkeley Well, NJ (II); Cooper Road, NJ (II); Friedman Property, NJ (II); South Brunswick Landfill, NJ (II)*; Suffern Village Well Field, NY (II); Middletown Road, MD (III); New Castle Steel DE (III); Presque Isle, PA (III); Taylor Borough, PA (III)*; Voortman Farm, PA (III); Westline, PA (III)*; Independent Nail, SC (IV)*; Tri-City Conservation, FL (IV); Varsol Spill, FL (IV); IMC Terre Haute, IN (V); Morris Arsenic, MN (V); NL/Taracorp/Golden Auto Parts, MN (V)*; Peterson Sand & Gravel, IL (V); Poer Farm, IN (V); Cecil Lindsey, AR (VI); Gurley Pit, AR (VI); Highlands Acid Pit, TX (VI)*; Sand Springs, OK (VI)*; Stewco, TX (VI); Big River Sand, KS (VII); Ordot Landfill, GU (IX); Toftdahl Drum, WA (X)*
O & M	Auburn Road, NH (I); Baird & McGuire, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Laurel Park, CT (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); Haviland Complex, NY (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, KY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Love Canal, NY (II);

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Remedy Selection (continued)	**Site, State (Region)**
O & M (continued)	Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); South Brunswick Landfill, NJ (II)*; Spence Farm, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Vega Alta, PR (II); Vestal, NY (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Chisman Creek, VA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Heleva Landfill, PA (III); Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA (III)*; Limestone Road, MD (III); Matthews Electroplating, VA (III); Middletown Airfield, PA (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Tybouts Corner Landfill, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance Works, VA (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); A. L. Taylor, KY (IV); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Dixiana, SC (IV); Sodyeco, NC (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL

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Remedy Selection (continued)	**Site, State (Region)**
O & M (continued)	(V)*; Charlevoix, MI (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V); Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Odessa Chromium II, TX (VI)*; Old Inger, LA (VI); Petro-Chemical Systems, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/SJ-6, NM (VI)*; Tar Creek, OK (VI); United Creosoting, TX (VI); United Nuclear, NM (VI); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Ellisville Site Area, MO (VII)*; Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Times Beach, MO (VII)*; Arsenic Trioxide, ND (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*;

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Remedy Selection (continued)	**Site, State (Region)**
O & M (continued)	Denver Radium/ROBCO, CO (VIII)*; Libby Ground Water, MT (VIII); Milltown, MT (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Indian Bend Wash, AZ (IX); Iron Mountain Mine, CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); Operating Industries, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos, CA (IX); Stringfellow Acid Pits, CA (IX)*; Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Ponders Corner-IRM, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Toftdahl Drum, WA (X); United Chrome, OR (X); Western Processing, WA (X)*
ROD Addendum	Sylvester, NH (I); Tyson's Dump (Amendment), PA (III); Milltown, MT (VIII)
Water Supply	
Alternate Water Supply	Auburn Road, NH (I): Charles George, MA (I); Davis Liquid Waste, RI (I); Winthrop Landfill-EDD, ME (I); American Thermostat, NY (II); Bridgeport, NJ (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); GE Moreau, NY (II); Haviland Complex, NY (II); Kentucky Avenue Well Field, NY (II); Krysowaty Farm, NJ (II); Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Olean Well Field, NY (II); Price Landfill, NJ (II); Rocky Hill, NJ (II); Vega Alta, PR (II); Williams Property, NJ (II); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Chisman Creek, VA (III); Fischer & Porter, PA (III); Industrial Lane, PA (III); Kimberton, PA (III); Matthews Electroplating, VA (III); Middletown Airfield, PA (III); Palmetto Wood Preserving, SC (IV); Powersville Landfill, GA (IV); Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; Industrial Excess Landfill, OH (V); Kummer Landfill, MN (V); Lake Sandy Jo, IN (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Water Supply System, MN

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Water Supply

Alternate Water Supply (continued)	(V)*; Old Mill, OH (V); Reilly Tar, MN (V); South Andover, MN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); South Valley-IRM, NM (VI); Cherokee County/Galena, KS (VII); Deere, John, Dubuque Works, IA (VII); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Milltown, MT (VIII); Smuggler Mountain, CO (VIII); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Landfill, WA (X)
Drinking Water Contaminants	Auburn Road, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Kellogg-Deering Well Field, Old Springfield Landfill, VT (I); Rose Disposal Pit, MA (I); CT (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); Endicott Village Well Field, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Kentucky Avenue Well Field, NY (II); Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Well Field, NJ (II); Rocky Hill, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Williams Property, NJ (II); Avtex Fibers, VA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Chisman Creek, VA (III); Delaware Sand and Gravel, DE (III); Fischer & Porter, PA (III); Henderson Road, PA (III); Industrial Lane, PA (III); Kimberton, PA (III); Middletown Airfield, PA (III); New Castle Steel DE (III); Tyson's Dump, PA (III)*; Wildcat Landfill, DE (III); Geiger (C&M Oil), SC (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodyeco, NC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Byron Johnson Salvage Yard, IL (V)*; Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Eau Claire-IRM, WI (V); Industrial Excess Landfill, OH (V); Lake Sandy Jo, IN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V); Seymour, IN (V)*; Tower Chemical, FL (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V);

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Water Supply (continued)	**Site, State (Region)**
Drinking Water Contaminants (continued)	Hardage/Criner, OK (VI); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Odessa Chromium II, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Des Moines TCE, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4)*, CA (IX)*; Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X)
Site Specific Characteristics	
Flood Plain	Baird & McGuire, MA (I); Cannon Engineering, MA (I); Keefe Environmental Services, NH (I)*; Tinkham Garage, NH (I); Yaworski Lagoon, CT (I); Burnt Fly Bog, NJ (II)*; Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Florence Landfill, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Renora Inc., NJ (II); Sharkey Landfill, NJ (II); Ambler Asbestos Piles, PA (III); Bendix, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III)*; Drake Chemical, PA (III); Fike Chemical, WV (III); L.A. Clarke & Son, VA (III); Palmerton Zinc, PA (III)*; West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); Wamchem, SC (IV); A&F Materials, IL (V); A&F Materials-EDD, IL (V)*; Belvidere Landfill, IL (V); FMC Corporation, MN (V)*;Fort Wayne Reduction, IN (V); Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V);Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*; Cleve Reber, LA (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Newport Dump Site, KY (IV); French Limited, TX (VI); Gurley Pit, AR (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Koppers/Texarkana, TX (VI); MOTCO, TX (VI); Sikes Disposal Pits, TX (VI); Triangle Chemical, TX (VI);

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Site Specific Characteristics (continued)	**Site, State (Region)**
Flood Plain (continued)	Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Celtor Chemical, CA (IX)*;San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos, CA (IX); Frontier Hard Chrome (12/30/87), WA (X)
Seismic	McColl, CA (IX)
Sole-Source Aquifer	Davis Liquid Waste, RI (I); Price Landfill, NJ (II); Rockaway Borough Wellfield, NJ (II); Bendix, PA (III); Biscayne Aquifer Sites, FL (IV); Pioneer Sand, FL (IV);Zellwood, FL (IV); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; South Valley/Edmunds Street, NM (VI)*; Hastings Groundwater/Colorado Avenue, NE (VII); Ordot Landfill, GU (IX); Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX)
Subsidence	McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Wildcat Landfill, DE (III); Wauconda Sand & Gravel, IL (V); Highlands Acid Pit, TX (VI)
Standards/Regulations/ Permits/Guidance	
MCLs	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); American Thermostat, NY (II); Endicott Village Well Field, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Marathon Battery, NY (II)*; Montgomery Township, NJ (II)Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Reich Farm, NJ (II); ; Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kimberton, PA (III); Middletown Airfield, PA (III); New Castle Steel DE (III); Tyson's Dump, PA (III)*; Airco, KY (IV); Celanese Fibers

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
MCLs (continued)	Operations, NC (IV); Chemtronics, NC (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Allied/Ironton Coke, OH (V)*; Coshocton Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; Long Prairie, MN (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; IMC Terre Haute, IN (V); LaSalle Electrical Utilities, IL (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); U.S. Aviex, MI (V); Brio Refining, TX (VI); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*;Industrial Waste Control, AR (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; United Nuclear, NM (VI); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Broderick Wood Products, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); San Fernando Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Frontier Hard Chrome (07/05/88), WA (X)*
MCLGs	Rose Disposal Pit, MA (I); Drake Chemical, PA (III)*; Henderson Road, PA (III); Middletown Airfield, PA (III); National Starch, NC (IV); IMC Terre Haute, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); U.S. Aviex, MI (V)
ARARS	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*;

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
ARARs (continued)	Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Endicott Village Well Field, NY (II)*; Ewan Property, NJ (II); GE Moreau, NY (II); GE Wiring Devices, PR (II); Haviland Complex, NY (II); Katonah Municipal Well, NY; Kin-Buc Landfill, NJ (II); Montgomery Township Housing, NJ (II) Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Reich Farm, NJ (II);Ringwood Mines/Landfill, NY (II); Renora Inc., NJ (II); Rocky Hill, NJ (II); South Brunswick Landfill, NJ (II)*; Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Montgomery Township, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Chisman Creek, VA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Middletown Airfield, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III): Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III);Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV): Goodrich, B.F., KY (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodeyco, NC (IV); Tower Chemical, FL (IV); Tri-City Conservation, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Coshocton Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V);

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
ARARs (continued)	New Brighton/Arden Hills/St. Anthony, MN (V); New Brighton (TCAAP), MN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); South Andover, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood Products, AR (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Midland Products, AR (VI); North Cavalcade Street, TX (VI); Petro-Chemical System, TX (VI); Sand Springs, OK (VI)*; Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); Anaconda Smelter/Mill Creek, MT (VIII); Central City/Clear Creek, CO (VIII); Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Rocky Mountain Arsenal, CO (VII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); Selma Pressure Treating,

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ARARs (continued)	CA (IX); South Bay Asbestos, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Colbert Landfills, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X)
Clean Air Act	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); Endicott Village Well Field, NY (II); Lipari Landfill, NJ (II)*; Reich Farm, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Fike Chemical, WV (III); Tyson's Dump, PA (III)*; Airco, KY (IV); Goodrich B.F., KY (IV); National Starch, NC (IV); Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; New Brighton (TCAAP), MN (V)*; Seymour, IN (V)*; U.S. Aviex, MI (V); Velsicol Chemical, IL (V); French Limited, TX (VI); Gurley Pit, AR (VI); Arkansas City Dump, KS (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Operating Industries (11/16/87), CA (IX)*; San Fernando Area I, CA (IX); South Bay Asbestos, CA (IX); Gould, OR (X)
Clean Water Act	Cannon Engineering, MA (I); Davis Liquid Waste, RI (I); Keefe Environmental Services, NH (I)*; Landfill & Resource Recovery, RI (I); ; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Chemical Control, NJ (II)*; Endicott Village Well Field, NY (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Lipari Landfill, NJ (II)*; Nascolite, NJ (II); York Oil, NY (II); South Brunswick Landfill, NJ (II); Vega Alta, PR (II); Volney Landfill, NY (II); Avtex Fibers, VA (III); Bendix, PA (III); Chisman Creek, VA (III)*; Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; West

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Clean Water Act (continued)	Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); Chemtronics, NC (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V); Fort Wayne Reduction, IN (V); LaSalle Electrical Utilities, IL (V)*; Liquid Disposal, MI (V); Ninth Avenue Dump, IN (V); Pristine, OH (V); Rose Township, MI (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Brio Refining, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; South Calvacade Street, TX (VI); Arkansas City Dump, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Ordot Landfill, GU (IX); Stringfellow Acid Pits, CA (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*
Drinking Water Standards	Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Old Springfield Landfill, VT (I); Yaworski Lagoon, CT (I); GE Moreau, NY (II); Marathon Battery, NY (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Upjohn Manufacturing, PR (II); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Coleman Evans, FL (IV); Old Inger, LA (IV); Tri-City Conservation, FL (IV); Allied/Ironton Coke, OH (V)*; Burrows Sanitation, MI (VI); New Brighton/Arden Hills/St. Anthony, MN (V)*; IMC Terre Haute, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; United Nuclear, NM (VI); Milltown, MT (VIII); Indian Bend Wash, AZ (IX); MGM Brakes, CA (IX); Colbert Landfill, WA (X); United Chrome, OR (X)

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Standards/Regulations/ Permits/Guidance (continued)	Site, State (Region)
Institutional Controls	Beacon Heights, CT (I); Cannon Engineering, MA (I); Iron Horse Park, MA (I); Laurel Park, CT (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Winthrop Landfill-EDD, ME (I); Asbestos Dump, NJ (II); Friedman Property, NJ (II); GE Moreau, NY (II); Kin-Buc Landfill, NJ (II); Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II); Olean Well Field, NY (II); Rocky Hill, NJ (II); Waldick Aerospace, NJ (II); Avtex Fibers, VA (III); Berks Sand Pit, PA (III); Chisman Creek, VA (III); Dorney Road Landfill, PA (III); Henderson Road, PA (III); Industrial Lane, PA (III); L.A. Clarke & Son, VA (III); Saltville Waste Disposal Ponds, VA (III); Tybouts Corner, DE (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Biscayne Aquifer Sites, FL (IV); Chemtronics, NC (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Newport Dump Site, KY (IV); Pepper's Steel-EDD, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); A&F Materials-EDD, IL (V); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Charlevoix, MI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Johns-Manville, IL (V); Lake Sandy Jo, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); Sand Springs, OK (VI)*; South Valley/SJ-6, NM (VI)*; United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Brio Refining, TX (VI); Dixie Oil, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood Products; AR (VI); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Old Inger, LA (VI); United Creosoting, TX (VI); Arkansas City Dump, KS (VII); Conservation Chemical, MO (VII); Fulbright/Sac River Landfill, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Times Beach, MO (VII)*; Arsenic Trioxide, ND (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium/Open Space, CO (VIII)*; Libby Ground Water, MT (VIII); South Bay Asbestos, CA (IX); Commencement Bay/Nearshore, WA (X);

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
Institutional Controls (continued)	Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
Public Health Advisory (III)	Ambler Asbestos Piles, PA (III); Lansdowne Radiation, PA
RCRA	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Landfill & Resource Recovery, RI (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Rose Disposal Pit, MA (I); Western Sand & Gravel, RI (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Diamond Alkali, NJ (II); Ewan Property, NJ (II); GE Wiring Devices, PR (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Reich Farm, NJ (II); South Brunswick Landfill, NJ (II)*; PAS Oswego, NY (II); Volney Landfill, NY (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); L.A. Clarke & Son, VA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); Biscayne Aquifer Sites, FL (IV); Brown Wood Preserving, FL (IV); Chemtronics, NC (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Newport Dump Site, KY (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Burrows Sanitation, MI (V); Eau Claire Municipal Well Field, WI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Marion/Bragg Landfill, IN (V); Mason County Landfill, MI

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
RCRA (continued)	(V); Ninth Avenue Dump, IN (V); Old Mill, OH (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Ellisville Site Area, MO (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Central City/Clear Creek, CO (VIII); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; San Fernando Area I, CA (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX) Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*
RCRA Closure Requirements	Landfill & Resource Recovery, RI (I); Re-Solve, MA (I)*; Winthrop Landfill-EDD, ME (I);Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Bridgeport, NJ (II); Combe Fill North Landfill, NJ (II); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Enterprise Avenue, PA (III); Kane & Lombard, MD (III); Moyer Landfill, PA (III); Tyson's Dump (Amendment), PA (III); West Virginia Ordnance, WV (III)*; Gallaway Ponds, TN (IV); Pioneer Sand, FL (IV); Allied/Ironton Coke, OH (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); Rose Township, MI (V); Summit National, OH (V); Velsicol Chemical, IL (V); Bayou Sorrel, LA (VI); Industrial Waste Control, AR (VI); Conservation Chemical, MO (VII); Conservation Chemical, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Selma Pressure

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
RCRA Closure Requirements	Treating, CA (IX); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); South Tacoma, WA (X); Western Processing, WA (X)*
Alternate Closure	Davis Liquid Waste, RI (I); Ringwood Mines/Landfill, NY (II); Kane & Lombard, MD (III); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Johns-Mansville, IL (V) Velsicol Chemical, IL (V); Arkansas City Dump, KS (VII); Frontier Hard Chrome (12/30/87), WA (X)
Clean Closure	GE Wiring Devices, PR (II); Renora Inc., NJ (II); Williams Property, NJ (II); Ordnance Works Disposal, WV (III); Southern Maryland Wood, MD (III); Bayou Bonfouca, LA (VI)* Midwest Manufacturing/North Farm, IA (VII)
Landfill Closure	Landfill & Resource Recovery, RI (I); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Allied/Ironton Coke, OH (V)*; IMC Terre Haute, IN (V); Johns-Manville, IL (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Summit National, OH (V); Waste Disposal Engineering, MN (V); Hardage/Criner, OK (VI); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X)
RCRA Landfill Specifications	Picillo Farm, RI (I); Caldwell Trucking, NJ (II); Lang Property, NJ (II); Sharkey Landfill, NJ (II); Drake Chemical, PA (III); Tyson's Dump, PA (III); Airco, KY (IV); American Creosote, FL (IV); Goodrich, B.F., KY (IV); Pioneer Sand, FL (IV); Forest Waste Disposal, MI (V)*; Spiegelberg Landfill, MI (V); Bio-Ecology Systems, TX (VI); Western Processing, WA (X)*
RCRA Locational Requirements	Tyson's Dump, PA (III); Berlin & Farro, MI (V)
Safe Drinking Water Act	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I);

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
Safe Drinking Water Act (continued)	American Thermostat, NY (II); Endicott Village Well Field, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Marathon Battery, NY (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Volney Landfill, NY (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Henderson Road, PA (III); Kimberton, PA (III); Middletown Airfield, PA (III); New Castle Steel DE (III); Tyson's Dump, PA (III)*; Voortman Farm, PA (III); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Flowood, MS (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Eau Claire Municipal Well Field, WI (V)*; Corporation, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Long Prairie, MN (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Broderick Wood Products, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); San Fernando Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X)

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Standards/Regulations/ Permits/Guidance (continued)	Site, State (Region)
State Criteria	Cannon Engineering, MA (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Landfill & Resource Recovery, RI (I); Re-Solve, MA (I)*; American Thermostat, NY (II); Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II)*; Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); GE Moreau, NY (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Suffern Village Well Field, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); New Castle, DE (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Alpha Chemical, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Coleman Evans, FL (IV); Hipps Road Landfill, FL (IV); Powersville Landfill, GA (IV); SCRDI Dixiana, SC (IV); Sodyeco, NC (IV); Tri-City Conservation, FL (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V)*; Allied/Ironton Coke, OH (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); NL/Taracorp/Golden Auto Parts, MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove

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Standards/Regulations/ Permits/Guidance (continued)	**Site, State (Region)**
State Criteria (continued)	Landfill, MN (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Schmalz Dump, WI (V)*; Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Brio Refining, TX (VI); Dixie Oil, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Ellisville Site Area, MO (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Union Pacific, WY (VIII); Indian Bend Wash, AZ (IX); Iron Mountain Mine, CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); South Bay Asbestos, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Martin Marietta, OR (X); South Tacoma Channel-Well 12A, WA (X)*
State Permit	Iron Horse Park, MA (I); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Kin-Buc Landfill, NJ (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Delaware Sand and Gravel, DE (III); Fike Chemical, WV (III); Airco, KY (IV); Celanese Fibers Operations, NC (IV); Goodrich, B.F., KY (IV); Verona Well Field-IRM, MI (V) South Calvacade Street, TX (VI); Motorola 52nd Street, AZ (IX)
Toxic Substances Control Act	Cannon Engineering, MA (I); Picillo Farm, RI (I) Re-Solve, MA (I)*; Burnt Fly Bog, NJ (II)*; Krysowaty Farm, NJ (II); Ludlow Sand & Gravel, NY (II); Renora Inc., NJ (II); York Oil, NY (II); Douglassville Disposal, PA (III)*; Chemtronics, NC (IV); Mowbray Engineering, AL (IV); Belvidere Landfill, IL (V); Fields Brook, OH (V) LaSalle Electrical Utilities, IL (V)*; Ninth Avenue Dump, IN (V);

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Standards/Regulations/ Permits/Guidance **(continued)**	Site, State (Region)
Toxic Substances (continued)	Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Summit National, OH (V); U.S. Aviex, MI Control Act (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waste Disposal Engineering, MN (V); French Limited, TX (VI); Sol Lynn (03/25/88), TX (VI); Commencement Bay/Nearshore, WA (X); Brio Refining, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Industrial Waste Control, AR (VI); North Cavalcade Street, TX (VI); South Calvacade Street, TX (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Ordot Landfill, GU (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Pacific Hide and Fur, ID (X)
Water Quality Criteria	Re-Solve, MA (I)*; American Thermostat, NY (II); Chemical Control, NJ (II)*; Endicott Village Well Field, NY (II); Katonah Municipal Well, NY (II); Lipari Landfill, NJ (II)*Lipari Landfill, NJ (II)*; ; Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bendix, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Airco, KY (IV); Chemtronics, NC (IV); Coleman Evans, FL (IV); Goodrich, B.F., KY (IV); Wamchem, SC (IV); Allied/Ironton Coke, OH (V)*; Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Johns-Manville, IL (V); New Brighton-Water Supply System, MN (V)*; Northside Sanitary Landfill/Environmental
Testing/Pilot Studies	
Leachability Tests	Iron Horse Park, MA (I); Love Canal/93rd Street School, NY (II)*; Re-Solve, MA (I), Flowood, MS (IV); United Scrap Lead, OH (V); Midwest Manufacturing/North Farm, IA (VII); Broderick Wood Products, CO (VIII)
Treatability Studies	Davis Liquid Waste, RI (I); Landfill & Resource Recovery, RI (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Winthrop Landfill-EDD, ME (I); Burnt Fly Bog, NJ (II)*; Chemical Control, NJ (II)*; GE Wiring Devices, PR (II); Kin-Buc Landfill, NJ (II); Renora Inc., NJ (II); Montgomery Township Housing, NJ (II)*; Reich Farm, NJ (II); Tabernacle Drum Dump, NJ (II); York Oil, NY (II); Avtex

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Testing/Pilot Studies (continued)	**Site, State (Region)**
Treatability Studies (continued)	Fibers, VA (III); Bendix, PA (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); L.A. Clarke & Son, VA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III) Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA, (III); Southern Maryland Wood, MD (III); Brown Wood Preserving, FL (IV); Chemtronics, NC (IV); Leetown Pesticide, WV (IV); Sodyeco, NC (IV); Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Mid-State Disposal, WI (V); Pristine, OH (V); Seymour, IN (V)*; Bailey Waste Disposal, TX (VI); Koppers/Texarkana, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Inger, LA (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*;Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Broderick Wood Products, CO (VIII); Central City/Clear Creek, CO (VIII); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Lorentz Barrel & Drum, CA (IX)
Aeration	Cannon Engineering, MA (I); Groveland Wells, MA (I); McKin, ME (I); Ottati & Goss/Great Lakes, NH (I); Bendix, PA (III); Hollingsworth, FL (IV); Wamchem, SC (IV); Mason County Landfill, MI (V); South Valley/Edmunds Street, NM (VI)*; Triangle Chem., TX (VI); Indian Bend Wash, AZ (IX); San Fernando Area I, CA (IX); Tucson International Airport, AZ (IX)
Air Monitoring	Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Old Springfield Landfill, VT (I); GE Wiring Devices, PR (II); Ambler Asbestos Piles, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Ordnance Works Disposal, WV (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Perdido Groundwater, AL (IV); Forest Waste Disposal, MI (V)*; Johns-Manville, IL (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); Oak Grove Landfill, MN (V); United Scrap Lead, OH (V); Brio Refining, TX (VI); Dixie Oil, TX (VI); Koppers/Texarkana, TX (VI); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Operating Industries, CA (IX), Operating Industries (09/30/88), CA (IX)*; Commencement Bay/Tacoma, WA (X); Gould, OR (X)
Air Stripping	Davis Liquid Waste, RI (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Brewster Well Field, NY

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Technology (continued)	**Site, State (Region)**
Air Stripping (continued)	(II); Caldwell Trucking, NJ (II); Endicott Village Well Field, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Lang Property, NJ (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rocky Hill, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Bendix, PA (III); Berks Sand Pit, PA (III); Henderson Road, PA (III); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Tyson's Dump, PA (III); Tyson's Dump, PA (III)*; Airco, KY (IV); Biscayne Aquifer Sites, FL (IV); Celanese Fibers Operations, NC (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Belvidere Landfill, IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; LaSalle Electrical Utilities, IL (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Well Field, IN (V); New Brighton (TCAAP), MN (V)*; Pristine, OH (V); Rose Township, MI (V); Seymour, IN (V); Seymour, IN (V)*; U.S. Aviex, MI (V); Verona Well Field-IRM, MA (V); Verona Well Field, MI (V)*; Sol Lynn (09/23/88), TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Des Moines TCE, IA (VII); Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Operating Industries (11/16/87), CA (IX)*; San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*
Capping	Beacon Heights, CT (I); Charles George, MA (I)*; Hocomonco Pond, MA (I); Industri-plex, MA (I); Laurel Park, CT (I); Nyanza Chemical, MA (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I); Sylvester, NH (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II)*; Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Old Bethpage, NY (II); PAS Oswego, NY

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Technology (continued)	**Site, State (Region)**
Capping (continued)	(II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Volney Landfill, NY (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Heleva Landfill, PA (III); Kane & Lombard, MD (III); Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III)*; Tybouts Corner, DE (III); Tyson's Dump, PA (III); Wade, PA (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); A. L. Taylor, KY (IV); Chemtronics, NC (IV); Davie Landfill, FL (IV); Flowood, MS (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Newport Dump Site, KY (IV); Powersville Landfill, GA (IV); Sodyeco, NC (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Liquid Disposal, MI (V); Marion/Bragg Landfill, MI (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Lyme, OH (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Schmalz Dump, WI (V)*; Seymour, IN (V)*; Summit National, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bio-Ecology Systems Site, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Geneva Industries, TX, (VI); Gurley Pit, AR, (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Old Inger, LA (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI); Aidex, IA (VII)*; Conservation Chemical, MO (VII); Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Smuggler Mountain, CO (VIII); Iron Mountain Mine, CA (IX); Mountain View/Globe, AZ (IX); Selma Pressure Treating, CA (IX); South Bay Asbestos, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X);

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Technology (continued)	**Site, State (Region)**
Capping (continued)	Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X); Western Processing, WA (X)*
Containment	Iron Horse Park, MA (I); Landfill & Resource Recovery, RI (I); Asbestos Dump, NJ (II); Burnt Fly Bog, NJ (II)*; Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Upjohn Manufacturing, PR (II); Ambler Asbestos Piles, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Allied/Ironton Coke, OH (V)*; Forest Waste Disposal, MI (V)*; Mason County Landfill, MI (V); New Lyme, OH (V); Outboard Marine Corp., IL (V); Summit National, OH (V); Velsicol Chemical, IL (V); Bayou Sorrel, LA (VI); Industrial Waste Control, AR (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; Arkansas City Dump, KS (VII); Times Beach, MO (VII); South Bay Asbestos, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X)
Decontamination	Cannon Engineering, MA (I); Iron Horse Park, MA (I); Diamond Alkali, NJ (II) Ewan Property, NJ (II); Marathon Battery, NY (II)*; Pristine, OH (V); United Scrap Lead, OH (V); Brio Refining, TX (VI); Dixie Oil, TX (VI)
Dredging	Hocomonco Pond, MA (I); Hudson River, NY (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Marathon Battery, NY (II); Marathon Battery, NY (II)*; L.A. Clarke & Son, VA (III); Southern Maryland Wood, MD (III); Outboard Marine Corp., IL (V); Atchison/Santa Fe (Clovis), NM (VI); Tar Creek, OK (VI)
Excavation	Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Ottati & Goss/Great Lakes, NH (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); GE

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Technology (continued)	**Site, State (Region)**
Excavation (continued)	Moreau, NY (II); GE Wiring Devices, PR (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Love Canal, NY (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Renora Inc., NJ (II); Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Waldick Aerospace, NJ (II); Wide Beach, NY (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); Kane & Lombard, MD (III); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Lansdowne Radiation, PA (III)*; Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Ordnance Works Disposal, WV (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Southern Maryland Wood, MD (III); Tybouts Corner, DE (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Airco, KY (IV); American Creosote, FL (IV); Brown Wood Preserving, FL (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); Palmetto Wood Preserving, SC (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Fort Wayne Reduction, IN (V); Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Northernaire, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Seymour, IN (V)*; Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca, LA (VI)*;

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Technology (continued)	**Site, State (Region)**
Excavation (continued)	Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Geneva Industries, TX (VI); Dixie Oil, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); MOTCO, TX (VI); Petro-Chemical Systems, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI); Aidex, IA (VII)*; Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Fulbright/Sac River Landfill, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Sapce, CO (VIII)*; Denver Radium/ROBCO, CO (VIII)*; Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte, CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Selma Pressure Treating, CA (IX); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X)*
Filling	Iron Horse Park, MA (I); GE Wiring Devices, PR (II); Marathon Battery, NY (II)*; Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Aladdin Plating, PA (III); Drake Chemical, PA (III)*; Lehigh Electric, PA (III); Taylor Borough, PA (III); Wade, PA (III); Airco, KY (IV); Coleman Evans, FL (IV); Goodrich, B.F., KY (IV); A&F Materials-EDD, IL (V)*; Coshocton Landfill, OH (V); Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Cleve Reber, LA (VI); Koppers/Texarkana, TX (VI); South Calvacade Street, TX (VI); Tar Creek, OK (VI); Midwest Manufacturing/North Farm, IA (VII); Syntex Verona, MO (VII); Woodbury Chemical, CO (VIII), MGM Brakes, CA (IX); Martin Marietta, OR (X)

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Technology (continued)	**Site, State (Region)**
Granular Activated Carbon	Groveland Wells, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Kin-Buc Landfill, NJ (II); Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Tabernacle Drum Dump, NJ (II); Bendix, PA (III); Kimberton, PA (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Airco, KY (IV); Celanese Fibers Operations, NC (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Wamchem, SC (IV); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Lyme, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Velsicol Chemical, IL (V); Koppers/Texarkana, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Broderick Wood Products, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Stringfellow Acid Pits, CA (IX)* Tucson International Airport, AZ (IX); Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I)
Ground Water Monitoring	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); McKin, ME (I); Nyanza Chemical, MA (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Friedman Property, NJ (II); GE Moreau, NY (II); Haviland Complex, NY (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Well Field, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II);

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Technology (continued)	**Site, State (Region)**
Ground Water Monitoring (continued)	Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NY (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); South Brunswick Landfill, NJ (II)*; Suffern Village Well Field, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Limestone Road, MD (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Taylor Borough, PA (III)*; Tybouts Corner, DE (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Voortman Farm, PA (III); West Virginia Ordnance, WV (III)*; Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); Brown Wood Preserving, FL (IV); Chemtronics, NC (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Wamchem, SC (IV); A&F Materials-EDD, IL (V)*; Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Coshocton Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Lake Sandy Jo, IN (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Novaco Industries, MI (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Schmalz

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Technology **(continued)**	**Site, State (Region)**
Ground Water Monitoring (continued)	Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township, NY (II); Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); South Brunswick Landfill, NJ (II)*; Suffern Village Well Field, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Limestone Road, MD (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Taylor Borough, PA (III)*; Tybouts Corner, DE (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Voortman Farm, PA (III); West Virginia Ordnance, WV (III)*; Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); Brown Wood Preserving, FL (IV); Chemtronics, NC (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); National Starch, NC (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Wamchem, SC (IV); A&F Materials-EDD, IL (V)*; Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Coshocton Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; Lake Sandy Jo, IN (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Novaco Industries, MI (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Schmalz

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Technology (continued)	**Site, State (Region)**
Ground Water Monitoring (continued)	Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sand Springs, OK (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Ellisville Site Area, MO (VII)*; Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Arsenic Trioxide, ND (VIII); Broderick Wood Products, CO (VIII); California Gulch, CO (VIII); Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Toftdahl Drum, WA (X)
Ground Water Treatment	Baird & McGuire, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); McKin, ME (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Sylvester, NH (I); Sylvester-S, NH (I); Tinkham Garage, NH (I); Winthrop Landfill-EDD, ME (I); Brewster Well Field, NY (II); Combe Fill South Landfill, NJ (II);

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Technology (continued)	**Site, State (Region)**
Ground Water Treatment (continued)	Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Lipari Landfill, NJ (II)*; Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Williams Property, NJ (II); York Oil, NY (II); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Kimberton, PA (III); Leetown Pesticide, WV (III); Middletown Airfield, PA (III); Millcreek, PA (III); Southern Maryland Wood, MD (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Airco, KY (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); SCRDI Dixiana, SC (IV); Sapp Battery, FL (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Chem-Dyne-EDD, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); LaSalle Electrical Utilities, IL (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Novaco Industries, MI (V); Old Mill, OH (V); Pristine, OH (V); Rose Township, MI (V); Seymour, IN (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field, MI (V)*; Waste Disposal Engineering, MN (V); Brio Refining, TX (VI); Cleve Reber, LA (VI); French Limited, TX (VI); Geneva Industries, TX

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Technology (continued)	**Site, State (Region)**
Ground Water Treatment (continued)	(VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Midland Products, AR (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; United Nuclear, NM (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); California Gulch, CO (VIII); Des Moines TCE, IA (VII); Marshall Landfill, CO (VIII); Rocky Mountain Arsenal, CO (VIII); Union Pacific, WY (VIII); Del Norte, CA (IX); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); San Fernando Area I, CA (IX); San Gabriel Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X)*
Incineration	Baird & McGuire, MA (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Landfill & Resource Recovery, RI (I); Ottati & Goss/Great Lakes, NH (I); Rose Disposal Pit, MA (I); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Ewan Property, NJ (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II)*; Reich Farm, NJ (II); Swope Oil, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Lackawanna Refuse Site, PA (III); Ordnance Works Disposal, WV (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; Westline, PA (III); Wildcat Landfill, DE (III); Coleman Evans, FL (IV); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); Soydeco, NC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Acme Solvents, IL (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Fields Brook, OH (V); Fort Wayne Reduction, IN (V); LaSalle Electrical Utilities, IL (V)*; LaSalle Electrical, IL (V); Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil, OH (V)*; Metamora Landfill, MI (V); Rose Township, MI (V); Spiegelberg Landfill, MI (V); Summit

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Technology (continued)	**Site, State (Region)**
Incineration (continued)	National, OH (V); Waste Disposal Engineering, MN (V); Bayou Bonfouca, LA (VI)*; Brio Refining, TX (VI); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); MOTCO, TX (VI); Sikes Disposal Pits, TX (VI); South Calvacade Street, TX (VI); Triangle Chem., TX (VI); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Woodbury Chemical, CO (VIII); Western Processing, WA (X)
Land Treatment	Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Re-Solve, MA (I)*; Renora Inc., NJ (II); L.A. Clarke & Son, VA (III); Palmerton Zinc, PA (III); Brown Wood Preserving, FL (IV); Atchison/Santa Fe (Clovis), NM (VI); Old Inger, LA (VI)
Leachate Collection/ Treatment	Beacon Heights, CT (I); Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Picillo Farm, RI (I); Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Price Landfill, NJ (II)*; Volney Landfill, NY (II); Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Tyson's Dump (Amendment), PA (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Newport Dump Site, KY (IV); Pioneer Sand, FL (IV); Allied/Ironton Coke, OH (V)*; Coshocton Landfill, OH (V); Forest Waste Disposal, MI (V)*; Mid-State Disposal, WI (V); New Lyme, OH (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V); Hardage/Criner, OK (VI); Petro-Chemical Systems, TX (VI); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Ordot Landfill, GU (IX); Martin Marietta, OR (X); United Chrome, OR (X)
Levees	Baird & McGuire, MA (I); Douglassville, PA (III); Old Inger, LA (VI) Times Beach, MO (VII)*; South Bay Asbestos, CA (IX)

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Technology (continued)	**Site, State (Region)**
Offsite Discharge	Groveland Wells, MA (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); GE Moreau, NY (II); GE Wiring Devices, PR (II); Katonah Municipal Well, NY; Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Reich Farm, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); York Oil, NY (II); Drake Chemical, PA (III)*; Henderson Road, PA (III); Tyson's Dump, PA (III)*; Airco, KY (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Wamchem, SC (IV); Belvidere Landfill, IL (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); LaSalle Electrical Utilities, IL (V)*; Long Prairie, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); French Limited, TX (VI); Industrial Waste Control, AR (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Central City/Clear Creek, CO (VIII); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX) Tucson International Airport, AZ (IX); Frontier Hard Chrome (07/05/88), WA (X)*
Offsite Disposal	Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); McKin, ME (I)*; Re-Solve, MA (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Chemical Control, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vega Alta, PR (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Berks Sand Pit, PA (III); Bruin Lagoon, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Harvey-Knott, DE (III); Lackawanna Refuse Site, PA (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo

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Technology (continued)	**Site, State (Region)**
Offsite Disposal (continued)	Associates, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA, (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Wildcat Landfill, DE (III); Brown Wood Preserving, FL (IV); Distler Brickyard, KY (IV); Miami Drum Services, FL (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); SCRDI Dixiana, SC (IV); Soydeco, NC (IV); Tower Chemical, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Arcanum Iron & Metal, OH (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Forest Waste, MI (V)*; Johns-Manville, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmalz Dump, WI (V); Seymour, IN (V)*; Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Dixie Oil, TX (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); South Calvacade Street, TX (VI); Triangle Chem., TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Deere, John, Dubuque Works, IA (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Fulbright/Sac River Landfill, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Broderick Wood Products, CO (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium/ROBCO, CO (VIII)*; Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Gould, OR (X); Stringfellow Acid Pits-IRM, CA (IX); Commencement Bay/Tacoma, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Offsite Treatment	Cannon Engineering, MA (I); Laurel Park, CT (I); Brewster Well Field, NY (II); Ewan Property, NJ (II); GE Moreau, NY (II); Kin-Buc Landfill, NJ (II); Reich Farm, NJ (II);

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Technology (continued)	**Site, State (Region)**
Offsite Treatment (continued)	Renora Inc., NJ (II); Upjohn Manufacturing, PR (II); Volney Landfill, NY (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Rhinehart Tire Fire, VA (III); Tyson's Dump, PA (III)*; Sodyeco, NC (IV); Tower Chemical, FL (IV); Laskin/Poplar Oil, OH (V)* Mid-State Disposal, WI (V); Industrial Waste Control, AR (VI); North Cavalcade Street, TX (VI); South Calvacade Street, TX (VI); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Commencement Bay/Tacoma, WA (X)
Onsite Containment	Re-Solve, MA (I); Asbestos Dump, NJ (II); GE Moreau, NY (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Enterprise Avenue, PA (III); Kane & Lombard, MD (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III)*; West Virginia Ordnance, WV (III)*; Davie Landfill, FL (IV); National Starch, NC (IV); Tower Chemical, FL (IV); Allied/Ironton Coke, OH (V)*; Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); New Lyme, OH (V); Ninth Avenue Dump, IN (V); Outboard Marine Corp., IL (V); Summit National, OH (V); Velsicol Chemical, IL (V); Bio-Ecology Systems, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); United Creosoting, TX (VI); Arkansas City Dump, KS (VII); Ellisville Site Area, MO (VII)*; Times Beach, MO (VII); Anaconda Smelter/Mill Creek, MT (VIII); South Bay Asbestos, CA (IX); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Western Processing, WA (X)*
Onsite Discharge	Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Endicott Village Well Field, NY (II); Haviland Complex, NY (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Rocky Hill, NJ (II); Williams Property, NJ (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Delaware Sand and Gravel, DE (III); Henderson Road, PA (III); West Virginia Ordnance, WV (III)*; Celanese Fibers Operations, NC (IV); Perdido Groundwater, AL (IV); Zellwood, FL (IV); Liquid Disposal, MI (V) Ninth Avenue Dump, IN (V); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sol Lynn

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Technology (continued)	Site, State (Region)
Onsite Discharge (continued)	(09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; Fulbright/Sac River Landfill, MO (VII); Lorentz Barrel & Drum, CA (IX); Martin Marietta, OR (X)
Onsite Disposal	Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Laurel Park, CT (I); Picillo Farm, RI (I); Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; GE Wiring Devices, PR (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Old Bethpage, NY (II); Ambler Asbestos Piles, PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Southern Maryland Wood, MD (III); Airco, KY (IV); American Creosote, FL (IV); Chemtronics, NC (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); SCRDI Dixiana, SC (IV); Sapp Battery, FL (IV); Arcanum Iron & Metal, OH (V); Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); LaSalle Electrical, IL (V); Liquid Disposal, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Schmalz Dump, WI (V)*; Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Crystal City Airport, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Petro-Chemical Systems, TX (VI); Sikes Disposal Pits, TX (VI); Aidex, IA (VII)*; Times Beach, MO (VII)*; Denver Radium III, CO (VIII)*; Smuggler Mountain, CO (VIII); Mountain View/Globe, AZ (IX); Gould, OR (X); Martin Marietta, OR (X); Western Processing, WA (X)*
Onsite Treatment	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Chemical Control, NJ (II)*; Endicott Village Well Field, NY (II); GE Moreau, NY (II); GE Wiring Devices, PR (II); Haviland Complex, NJ (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery, NY (II)*; Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Reich Farm,

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Technology **(continued)**	**Site, State (Region)**
Onsite Treatment (continued)	NJ (II); Renora Inc., NJ (II); Rocky Hill, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Middletown Airfield, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance, WV (III)*; Airco, KY (IV); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Eau Claire Municipal Well Field, WI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Pristine, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; French Limited, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Arkansas City Dump, KS (VII); Deere, John, Dubuque Works, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); California Gulch, CO

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Technology (continued)	Site, State (Region)
Onsite Treatment (continued)	(VIII); Indian Bend Wash, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X) Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X)
Plume Management	Groveland Wells, MA (I); Old Springfield Landfill, VT (I); Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I); GE Moreau, NY (II); Haviland Company, NY (II); Hyde Park-EDD, NY (II); Old Bethpage, NY (II); Price Landfill, NJ (III) Delaware Sand and Gravel, DE (III); Burrows Sanitation, MI (V); Seymour, IN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Cleve Reber, LA (VI); South Valley/Edmunds Street, NM (VI)*; United Nuclear, NM (VI); San Fernando Area I, CA (IX); Commencement Bay/Tacoma, WA (X)
Publicly Owned Treatment Works (POTW)	Laurel Park, CT (I); Old Springfield Landfill, VT (I) Tinkham Garage, NH (I); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Helen Kramer, NJ (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lipari Landfill, NJ (II)*; Vega Alta, PR (II); Drake Chemical, PA (III)*; Rhinehart Tire Fire, VA (III); Tybouts Corner, DE (III); National Starch, NC (IV); FMC Corporation, MN (V); Seymour, IN (V); Brio Refining, TX (VI); Dixie Oil, TX (VI); Sol Lynn (03/25/88), TX (VI); Del Norte, CA (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Gabriel Area I, CA (IX); Stringfellow Acid Pits, CA (IX)*; Commencement Bay/Tacoma, WA (X); Western Processing, WA (X)*
Relocation	Lansdowne Radiation, PA (III); Lansdowne Radiation, PA (III)*; Waste Disposal Engineering, MN (V); Koppers/Texarkana, TX (VI); Petro-Chemical Systems, TX (VI); United Creosoting, TX (VI); Times Beach, MO (VII); Times Beach, MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Mountain View/Globe, AZ (IX)

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Technology (continued)	**Site, State (Region)**
Slurry Wall	Sylvester, NH (I); Diamond Alkali, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); PAS Oswego, NY (II); Volney Landfill, NY (II); Kane & Lombard, MD (III); Southern Maryland Wood, MD (III); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Forest Waste Disposal, MI (V)*; Liquid Disposal, MI (V); Ninth Avenue Dump, IN (V); Schmalz Dump, WI (V)*; Summit National, OH (V); Waste Disposal Engineering, MN (V); Bayou Sorrel, LA (VI); Geneva Industries, TX (VI); Industrial Waste Control, AR (VI); Union Pacific, WY (VIII)
Soil Washing/Flushing	Re-Solve, MA (I)*, L.A. Clarke & Son, VA (III); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Koppers/Texarkana, TX (VI); South Calvacade Street, TX (VI)
Solidification/ Stabilization	Charles George Landfill 3 & 4, MA (I)*; Re-Solve, MA (I); Chemical Control, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Marathon Battery, NY (II)*; York Oil, NY (II); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Fike Chemical, WV (III); Aladdin Plating, PA (III); Chemtronics, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); Pepper's Steel, FL (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Tower Chemical, FL (IV); Burrows Sanitation, MI (V); Fields Brook, OH (V); Forest Waste, MI (V)*; Liquid Disposal, MI (V); Mid-State Disposal, WI (V); Velsicol Chemical, IL (V); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Arkansas City Dump, KS (VII); Midwest Manufacturing/North Farm, IA (VII); Denver Radium/ROBCO, CO (VIII); Selma Pressure Treating, CA (IX); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Queen City Farms, WA (X)Chemical, FL (IV); Velsicol Chemical, IL (V); Brio Refining, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Arkansas City Dump, KS (VII); Midwest Manufacturing/North Farm, IA (VII); Denver Radium/ROBCO, CO (VIII); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Queen City Farms-IRM/EDD, WA (X)

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Technology (continued)	Site, State (Region)
Treatment Technology (continued)	(II)*; Ewan Property, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Marathon Battery, NY (II); Marathon Battery, NY (II)*; Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Syncon Resins, NJ (II); Upjohn Manufacturing, PR (II); Wide Beach, NY (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Bruin Lagoon, PA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III)*; Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; West Virginia Ordnance Works, WV (III); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Coleman Evans, FL (IV); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Bayou Bonfouca, LA (VI); Burrows Sanitation, MI (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar, OH (V)*; Liquid Disposal, MI (V); Mid-State Disposal, WI (V); Pristine, OH (V); Seymour, IN (V)*; Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); French Limited, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Oil Mid-South Wood, AR (VI); MOTCO, TX (VI); North Cavalcade Street, TX (VI); Old Midland Products, AR (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Arkansas City Dump, KS (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Indian Bend Wash, AZ (IX); Lorentz Barrel & Drum,

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Technology (continued)	Site, State (Region)
Treatment Technology (continued)	CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (09/30/88), CA (IX)*; San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Pacific Hide and Fur, ID (X); Triangle Chemical, TX (VI); Stringfellow Acid Pits, CA (IX)*; United Chrome, OR (X); Western Processing, WA (X)*
Vacuum Extraction	Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Bendix, PA (III); Tyson's Dump (Amendment), PA (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Seymour, IN (V)*; Verona Well Field, MI (V)*; South Valley/PL-83, NM (VI)*; Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Motorola 52nd Street, AZ (IX)
Venting	Beacon Heights, CT (I); Charles George, MA (I)*; GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Heleva Landfill, PA (III); Moyer Landfill, PA (III); Allied/Ironton Coke, OH (V)*; IMC Terre Haute, IN (V); Long Prairie, MN (V); Mason County Landfill, MI (V); New Lyme, OH (V); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Hardage/Criner, OK (VI), Operating Industries (09/30/88), CA (IX)*; Martin Marietta, OR (X)

Miscellaneous

Municipally-Owned Site	Winthrop Landfill-EDD, ME (I); Rockaway Borough Wellfield, NJ (II); Volney Landfill, NY (II); Army Creek Landfill, DE (III); Enterprise Avenue, PA (III); Newport Dump Site, KY (IV); Powersville Landfill, GA (IV); Crystal City Airport, TX (VI); Fulbright/Sac River Landfill, MO (VII); Denver Radium Site Streets, CO (VIII), Ordot Landfill, GU (IX)
Wetlands	Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental Services, NH (I)*; Landfill & Resource Recovery, RI (I); Nyanza Chemical, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Tinkham Garage, NH (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Combe Fill South Landfill, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); PAS Oswego, NY (II); Renora Inc., NJ (II); Wide Beach, NY (II);

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Miscellaneous (continued)	**Site, State (Region)**
Wetlands (continued)	Avtex Fibers, VA (III); Bendix, PA (III); Chisman Creek, VA (III); Chisman Creek, VA (III)*; Drake Chemical, PA (III)*; Harvey-Knott, DE (III); L.A. Clarke & Son, VA (III); Millcreek, PA (III); Palmerton Zinc, PA (III)*; Southern Maryland Wood, MD (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance, WV (III)*; Wildcat Landfill, DE (III); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Kummer Sanitary Landfill, MN (V)*; Mason County Landfill, MI (V); Ninth Avenue Dump, IN (V); Oak Grove Landfill, MN (V); Reilly Tar & Chemical, MN (V)*; Rose Township, MI (V); Schmalz Dump, WI (V); Schmalz Dump, WI (V)*; Waste Disposal Engineering, MN (V); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Old Inger, LA (VI); Tar Creek, OK (VI), South Bay Asbestos, CA (IX)
Woodlands	Old Springfield Landfill, VT (I); Tinkham Garage, NH (I); Reich Farm, NJ (II); Lansdowne Radiation, PA (III); Palmerton Zinc, PA (III); Forest Waste Disposal, MI (V)*; Mason County Landfill, MI (V); United Scrap Lead, OH (V); Old Inger, LA (VI)
Historically Significant	**This category represents key words that will not be highlighted for Records of Decision signed after FY 1986.**
ACL	Sylvester, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Marathon Battery, NY (II)*; Blosenski Landfill, PA (III); Harvey-Knott, DE (III); Henderson Road, PA (III); West Virginia Ordnance, WV (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); Goodrich, B.F., KY (IV); Newport Dump Site, KY (IV); SCRDI Dixiana, SC (IV); Fort Wayne Reduction, IN (V); Velsicol Chemical, IL (V); Highlands Acid Pit, TX (VI); Aidex, IA (VII)*; Old Mill, OH (V); Martin Marietta, OR (X); Western Processing, WA (X)*
Background Levels	Nyanza Chemical, MA (I); Industrial Lane, PA (III); Palmerton Zinc, PA (III)*; Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Reilly Tar, MN (V); United Scrap Lead, OH (V); Triangle Chemical, TX (VI); United Nuclear,

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Historically Significant (continued)	**Site, State (Region)**
Background Levels (continued)	NM (VI); Aidex, IA (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Arsenic Trioxide, ND (VIII); Toftdahl Drum, WA (X)
Deferred Decision	Cannon/Plymouth, MA (I); Lipari Landfill, NJ (II)*; Swope Oil, NJ (II); Douglassville, PA (III); McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Tyson's Dump, PA (III); American Cresote, FL (IV); Davie Landfill, FL (IV); New Brighton/Arden Hills/St. Anthony, MN (V)*; Bayou Bonfouca, LA (VI); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*
Temporary Remedial Measure	Hudson River, NY (II); Byron Salvage Yard, IL (VI)*;Denver Radium/ROBCO, CO (VIII); Denver Radium/Card Property, CO (VIII)*; Union Pacific, WY (VIII)

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